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„Representation and Perception of Mapped Space"

The Use of Tourist Maps in the Imagining of the City

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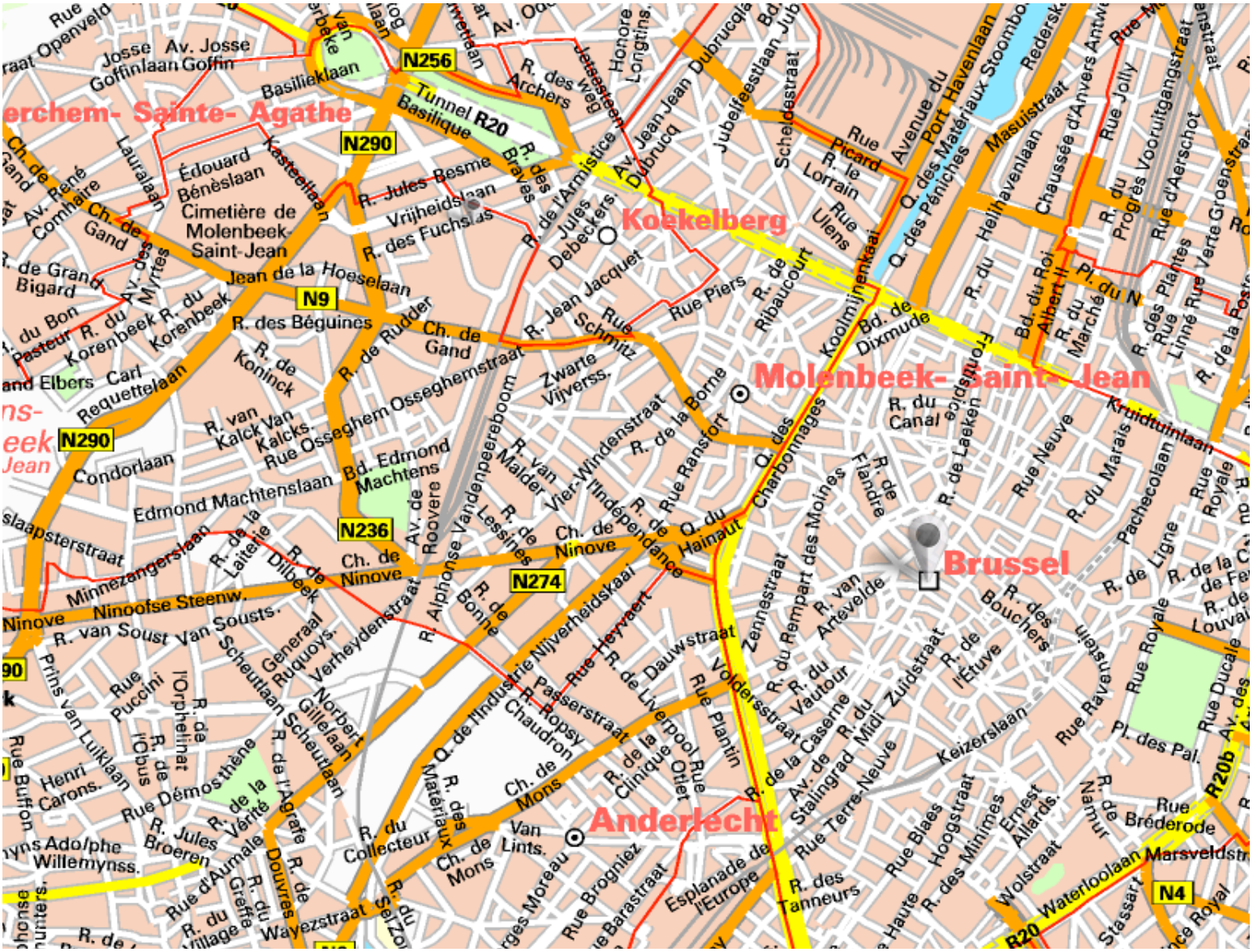

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ABSTRACT

Traveling to unknown places initiate new urban experiences and memories in the human mind. Spatial knowledge can be stored as mental maps and allows the individual to navigate and orientate in an urban space and to a specific image of it. Kevin Lynch (1960) analyzed mental maps and classified those into five city elements: paths, nodes, edges, districts and landmarks. Landmarks present an important orientation reference to tourists (Lynch 1960). This thesis applies this theory and relates it to the representation of mapped space on a specific city map, the USE-IT map for young traveler. With literature review and empirical research in two case studies Brussels and Warsaw, the perception of space of young traveler shall be analyzed and studied, if it is influenced by the local experience and creates a multifaceted image of the city. Results showed no correlation between the used map and the perceived city image, as they presented a strong landmark-oriented image of the cities. Most of the young traveler perceived a city image shaped by tourist sights and symbolic values. Despite the local and diverse suggestions on the USE-IT maps, those places were significantly limited on the drawn mental maps.

Reisen ermöglicht die Entdeckung neuer urbaner Erfahrungen und generiert Erinnerungen. Räumliche Zusammenhänge werden als mentale Karten, sog. „mental maps“ gespeichert und erlauben dem Menschen Navigation und Orientierung im urbanen Raum, wobei ein Abbild dieses Raumes entsteht. Kevin Lynch (1960) analysierte diese „mental maps“ und klassifizierte die abgebildeten Objekte in fünf Stadtelemente: Pfad, Knoten, Grenze, Stadtviertel und Wahrzeichen. Letztere sieht Lynch als bedeutendste Orientierungshilfe für Touristen (Lynch 1960). Vorliegende Masterarbeit verwendet diese Theorie und setzt sie in Relation mit der Repräsentation von kartiertem Raum durch einen speziellen Stadtplan, die USE-IT Stadtkarte für junge Reisende. Auf der Basis von Literaturrecherche und empirischer Forschung (Fallstudien Brüssel und Warschau) soll die Wahrnehmung von Raum durch junge Touristen analysiert werden. Dabei soll untersucht werden, inwiefern diese Wahrnehmung durch lokale Erlebnisse beeinflußt wird und ob dadurch ein facettenreiches (Ab-)Bild der Stadt kreiert wird. Die Ergebnisse zeigten keine eindeutigen Zusammenhänge zwischen dem Kartentyp und dem wahrgenommenen Stadtbild. Die meisten jungen Touristen nahmen ein Stadtbild wahr, welches von Sehenswürdigkeiten und symbolischen Werten geprägt war. Ortsspezifische Informationen der USE-IT Stadtkarten blieben ohne erkennbaren Einfluß auf die „mental maps“ der jungen Touristen.

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1. Introduction

> "Brussels is the capital of Europe, but we didn't know that when we started to build it. You'll encounter a strange mix of skyscrapers and small curving streets, where everybody gets lost. Really everybody, including the Belgians who are not from Brussels. Anyway, Brussels really provides everything that you expect from a real city: high buildings, busy traffic, an underground art scene, eccentric old ladies, bars on every corner, expensive cocktails, and lots of adventure if you're willing. Stay far away from the 'waffle squares' and you'll discover one of the greatest cities in Europe."
> (http://www.use-it.be/brussels)

Traveling to foreign or new places let people experience a different and unknown world, a place where routes and images are unfamiliar and undetected. Experiencing a city by strolling around, letting oneself lead by exciting landmarks and interesting objects and places. However, traveling nowadays is equipped with information: about the new place, its culture, people, language, buildings and history. Places provide tourist guidebooks and information brochures through tourist offices, web-presence, or even TV-commercials in order to create attractive images of their areas. Today, a variety of maps are available almost everywhere and accessible for everybody: maps of cities, public-transport-structures, geological structures of the earth, stars and other celestial systems, hip bars, different dialects of a country or other environments. Individuals can gather information from maps, orientate themselves in a specific area or are given an explicit message about a particular theme. People then remember specific moments and landmarks, streets and bars, feelings and situations from a certain place. Those features and impressions can create an image of this place and leave a particular picture in mind.

The previous quote cited a description of Brussels from the USE-IT map. This city map for young travelers praises the urban space in a specific view and invites the reader to look into unknown and local places. Do those 'alternative maps' or different city tours change the perception of a city? What do young people remember from a city? Is the perception and the image of the city influenced by the used city map?
Theories of perception of space can be found in the literature (Downs&Stea 2011; Mark et al. 1999; Lloyd&Steinke 1984; Tuan 1975), hence the American urban planner, Kevin Lynch,

translated the perception into a city image. In his work "The Image of the City" (1960), he studies the perception of city space of individuals and records the notion of five perceived categories: paths, edges, nodes, districts and landmarks (8). For tourists, he states, landmarks are crucial in the orientation of the city (Lynch 1960: 81). This thesis follows that notion and amplifies the study in correlation with a specific city map, the USE-IT map. Can a young travel map counter this impression? With local suggestions and cultural experiences, do users of the USE-IT map perceive a different city image than users of other tourist maps? With two case studies in Brussels, Belgium and Warsaw, Poland, the perception of the city space will be studied and interpreted.

1.1. Hypothesis and Research Question

The thesis follows the ideas of Kevin Lynch (1960), but analyzes the hypothesis, that the perception of space by USE-IT map users is influenced by the local experience and creates a multifaceted image of the city. This leads to the main focus of this Master thesis: the discussion of the representation and perception of mapped space. With help of two case studies, the following research question shall be answered:

How is the spatial experience of a city map reflected in the perceived images of this space?

Further, the following questions will help to find an answer: How do maps represent space? What images are represented?
As there is an unclear variety of tourist maps, this thesis focuses on the USE-IT map and will not differentiate between other kinds of tourist maps. This allows a detailed and qualitative shaped analysis.

1.2. Structure

This thesis is structured into two parts: the first "desktop research" part includes the chapter 2 on the theoretical background as well as chapter 3 on the methodology. Hereby, theories of representation and the perception of space are discussed and allow an overview of this topic. The second part deals with the empirical research and presents the results, analysis and discussion of the conducted questionnaires and interviews. Here, the theoretical background will be applied on the findings of the empirical research, and the hypothesis will be tested. The conclusion sums up the results and gives an outlook for any further research.

2. Theory of Space Representation

The subject of this thesis is the representation and perception of mapped space. One of the most common tools to represent space is seen in the cartographic map (Thrower 1996; MacEachern 2004). Maps reconstruct space in a simplified and elementary way and are used by individuals as guides and orientation (Corner 1999). Through reading the various city structures on a map, the spatial experience is stored in a cognitive map, which is reproducing the urban space in a modified way (Llyod 1989; Tuan 1975). But to understand the reproduced and perceived city image, the originator, the urban space, shall be defined beforehand. This shall be the basis for the representation of space on maps and a reference point when comparing the mental image to the real environment. Therefore, a connection between urban space, the representation of it on a map, and the product, the cognitive perception of individuals can be made.

Various disciplines such as mathematics and physics, philosophy and sociology, psychology, geography or other spatial studies are defining 'space' related to their field of study and explain different ideas (see e.g. de Certeau 1984; Faby&Koch 2006; Krier 2005; Perec 2008). The literature review for this theoretical chapter is mainly focused on philosophical or sociological concepts, whereas the physical and geographical definition of space will follow in chapter 2.3. As this thesis is dealing with the mapped urban space of cities, the mathematical or physical definition of space will only be part of this discussion when included geographical and spatial explanations.
First, different concepts of space shall introduce the topic, and will be followed by the question of the representation of urban space. Thirdly, different representation of space will be presented. Here, the map, as one of the representation tools will be discussed in chapter 2.3 into depth.
Therefore, the connection between space, its representation and the transcription of a map is made and allows the continuation of the question of perception of space in chapter 2.4.

2.1. Concepts of Space

> "There isn't one space, a beautiful space, a beautiful space round about, a beautiful space all around us, there's a whole lot of small bits of space, and one of these bits is a Métro corridor, and another of them is a public park." (Perec 2008: 5-6)

The French author George Perec points out multiple levels of space, as there exists more than one definition and notion of it. The following chapter combines different definitions of various disciplines, such as philosophical, sociological, architectural and later geographical sciences, which is necessary for the understanding of the representation of space.

In his book "Spieces of Spaces", Perec (2008) illustrates the everyday living. He defines space as the fascination and peculiarity of ordinary experiences, the everyday life becomes setting and synonym to his idea of space: the infra-ordinary. This notion of ordinary or even invisible situations, objects or moments plays the important role in Perec's definition of space. Perec is developing his definition of space from the ordinary, banal objects in life towards the equivalent of the universe by considering spaces in general. In all those heterogeneous levels of space, the usual life creates the representative picture of the space. Famous or important architecture, festivals or tourist attractions are not part of this banal space, instead of the extra-ordinary the fascination is dragged towards the infra-ordinary.

Following the notion of the infra-ordinary, the French philosopher Michel de Certeau (1984) defines space also in connection to everyday life and social practices. By moving and using a space, a place can be formed and filled with life, memories or social actions: "every 'proper' place is altered by the mark others have left on it." (de Certeau 1984: 69). A city is filled with that space and described by the physical environment, breeding ground for traditions and spatial experiences as well as the framework of the city itself, which is interlinked with global network and regulates its society (de Certeau 1984: 94). He sees the creation of the space within the human action of living, the everyday life, the spatial experience through walking or traveling.

Also the sociologist Henri Lefebvre is dealing with "The Production of Space" (1991). He describes the partitioning of space into 3 fields: the mental, physical and social. Therefore, every society or "each mode of production" is responsible for the creation of space (Lefebvre

1991: 31). Those actors or actions produce space containing the three aspects: spatial practice, representations of space, representational spaces (Lefebvre 1991: 32). The production of space therefore exists of the perceived, designed and experienced (Schmid 2005: 20). Those three categories are interrelated, dependent from each other and connected. Every individual encounters and interferes within space, which has been created by social but also physical elements and frames the city. Lefebvre concludes space as a social product, with the city as "Projektion der Gesellschaft auf das Terrain bzw. den Raum" (Schmid 2005: 36[1]). The Spanish sociologist Manuel Castells criticizes this theory (Schmid 2005), as society is giving space a shape and function, but not producing it. So, the city is only a space of collective consumption (Schmid 2005: 38) and reflects the traditions and habits rather than the process of production.

The sociologist Mark Gottdiener steps further towards the material production of space. In his book "The social Production of Urban Space" (1997) space is seen as "a physical location, a piece of a real estate as well as mental expression and existential freedom" (Gottdiener 1997: 123). Next to the social influence on the production of space, physical and material facts are added. Finally, the architect Rob Krier (2005) describes urban space as the totality of the internal and external space between and in buildings (22). The physical environment now defines space, where the social actions and experiences are influencing the surrounding. Like Perec (2008), Krier is analyzing different spaces (the street, the square, but also interior space) and only discusses the material and physical functions and importance. The social component compared to Perecs 'everyday life' is left out and does not play an important role within the architecture of space.

To sum up, space is a highly debated field and topic of many sciences. As mentioned, space can be seen as a product of social actions, explained in the ordinary moments of an everyday life or the movement and spatial experience through space (see Perec 2008; de Certeau 1991). Perception, design and experience produce, according to De Certeau (1984) the urban space and give useful elements to the further research of the mental maps. With Lefebvre (1991), the important physical element of the production of space is mentioned for the first time and confirmed by Gottdiener (1997) and Krier (2005). Here, as an architect, Krier is concentrating on the notion of the physical then social element and creates space through buildings and feasible monuments.

[1] Own translation: a projection of the society on terrain or space.

2.2. Methods of Space Representation

Substituting another object, while reproducing the original attributes and features or limiting all initial information to the main aspects and points, can be seen as representation. To that definition, Bartles (2005) is adding the condition of "Zweck und Absicht[2]" (13). Now, the representative object has to fulfill the criteria of intention and is ordered to give a characteristic picture of the original.
Space can be represented in many ways. Filling space with sounds or objects, music and art can draw the attention to public or private space. Books are filling space with letters, words and stories; paintings reproduce a moment in space and let the observer take part in a specific situation. Semiology, the study of signs, can be added to this discussion, as Henri Lefebvre (1991) mentions: "Any attempt to use such codes as a means of deciphering social space must surely reduce that space itself to the status of a message, and the inhabiting of it to the status of a reading." (7). This message can be seen as a representation of an original meaning of space. Also maps represent space, spatial facts or social situations as they portray the real space with simplified images and plans. Here the representation is clear as well, as the reality is limited to a certain message of the map.

This short overview gave an insight of the interpretation possibilities of space representation. This thesis deals with the representation of space through maps and will therefore continue with the explanation of cartographic attributes and conditions and give an overview of the history of maps.

[2] Own translation: „purpose and intention"

2.3. Space Representation in Maps

As mentioned in chapter 2.2, mapping is one method to represent space. The science of mapping, cartography, exists since ancient times and presents the actual spatial knowledge. Cartography plays an important role in the mapping process, where its function is to collect data and provide maps with useful and physical information.
This chapter deals with the overview of the map, to understand its processes, functions, ideas and aims. First, the development and history of cartography will be presented and second, the mapped space and its character will be explained.

Cartography

"Early maps from great civilizations were attempts to depict earth distributions graphically in order to better visualize them; like those of so-called "primitive" peoples, these maps served specific needs. Viewed in its development through time, the map details the changing thought of the human race, and few works seem to be such an excellent indicator of culture and civilization. In the modern world the map performs a number of significant functions: as a necessary tool in the comprehension of spatial phenomena; a most efficient device for the storage of information" (Thrower 1996: 1)

Maps are since ancient times important strategic and powerful tools to discover and role over nature and society as well as for navigation and orientation. Cartography is as the science of mapping an important interface between reality and the representation of it in the map (Hake et al. : 2002; MacEachern 2004). Its development in technique and use, perception in society and science can be seen by an overview of the function and history of cartography.
According to a general definition, cartography is a "discipline dealing with the conception, production, dissemination and study of maps" (Grünreich in Hake et al. 2002: 4). The four mentioned terms - conception, production, dissemination and study of maps - include already the main functions of the complex and wide field of cartography. As for conception, cartographers collect information and develop data banks. The production of maps allows cartographers to present the collected data in a visual way, which can be distributed and shown to a private or public audience. Cartographers are studying, developing and

analyzing the finished product, where they optimize it and follow trends of the dynamic changes in the world of communication. Communication therefore roles as the main function of cartography and describes the interaction between provided spatial information and the user (Hake et al. 2002; MacEachern 2004).

In the process of mapping, one function of cartography is the collection of information, which is mostly related to spatial topics. Those can be details about geographic, geologic and humanistic or other spatial objects and facts. The data are sorted and listed in data banks, which allow an overview and simple reuse for further communication. Although statistics also provides users with spatial facts, the demonstrative reutilization of those data can be possible in the map. Maps represent information with a clear and simple structure, where users simply gain spatial knowledge and an image of the presented reality (Hake et al. 2002: 5).

A map has not only to present a clear and appropriate image of the required information but also allow the user to perceive the right and wanted knowledge. Cartography consequently has to be sensitive to the user and further interpretations of the provided data (MacEachern 2004). Further, MacEachern (2004) mentions so called 'filters' involved in this mapmaking process. With those filters, information are selected, neglected, or proved. Cartographers, but also the map users do decide upon those filters, "on the cartographer's side of the system, these filters include objectives, knowledge and experience, abilities and attitudes, external considerations such as client demands, as well as the abstraction processes by which information is put into map form (…). For map use, the following factors were identified as filters: the perceptual and spatial abilities of readers, understanding of the symbol system (…), goals, attitudes, viewing time, intelligence, prior knowledge, and preconceptions" (MacEachern 2004: 5).

Seen in this light, the process of mapmaking not only involves decisions and preparation of cartographers but should also include the foreseeable consequences of the perceived image of the user. The abilities of the user as well as preconditions and environment play an important role for the representative image of the map.

History of Cartography

Cartography has always been a dynamic and interdisciplinary field and strongly connected to the demands and changes of the society. Spatial and time specific information change in their scope and scale: from local, secret and private to global, open and public. Nowadays, maps are available to everybody, the communication transmission is not only one-sided, but interaction between users – maps – cartographers is common (Hake et al. 2002).

Maps can be seen as a reflection of the current society, culture and knowledge (Thrower 1996). An overview of the history of cartography shall visualize this statement and clarify the communication between society and map.

First Map to Ptolemy's world map

A clay tablet, dated back to 2300 BC was found near ancient Babylon showing land area and rivers. Archeologists assume, this table describes the land limitation and declaration of a certain land. Later, in 1500 BC, a city plan of Nippur was produced. Main buildings and important institutions, like temples, were signalized and highlighted (Clark 2005). The empire of Rome was also presenting itself through different techniques of mapping: A bronze coin from 64 AD was decorated with glorious sceneries of war situations or latest inventions. A plan of Rome from 200 AD showed buildings and neighborhoods carved into marble with perfectly accuracy. Central and important structures peaked out through a different perspective. In that way, the emperor of Rome could show to its society and other cultures the significance and glory of its empire and advertised the biggest city at that time. Also a later produced world map from 300 AD gives the best insight in roman cartography: here the roman road network with detailed descriptions of street names and cities are drawn on an almost 7 meter long parchment scroll. Not only the unique recording of the network is remarkable, but also the intentionally wrong used map scale is presenting Italy as the center of the world with the enormous area of ancient Persia as a small country on the side (Barber 2006).

Those ancient maps and drawings depict the beginning of cartography, where this science was a tool for advertising and presenting itself to the society and the rest of the world. At that time, cartography was a medium to present not only limitations of private property but especially political hierarchy and military power of the producing empire or country (Hake et al. 2002; Faby&Koch 2006).

Claudius Ptolemy, a Greek geographer, created around 150 AD a compilation of a world map in 8 books. The first book content a detailed drawing of the (known) earth, the other books included the localization of places described by longitude and latitude. This book was the first of its kind dividing the earth into geographic coordinates and classified by a grid system. This aspect should become the most important characteristic of the modern cartography (Cosgrove 2004: 51). Also, in order to represent the earth in a two-dimensional way, Ptolemy used a conic map projection. Now, Europe was removed from the center of the world and also unknown areas were left out. This book was continuous reproduced and additions about new discoveries were made (Storr 1994; Clark 2005).

With his work, Ptolemy revealed not only the former general, technical and geographic knowledge but also fulfilled the needs of a covered picture of the world, as the human drive of explorations and discoveries was requesting it (Storr 1994).

Mercator until Snow

With the new culture of the Renaissance, the society was introduced to a new opening, a new access and reflection to universal knowledge. Cartography was influenced by the era of the Renaissance through the reintroduction and revival of Ptolemy's world map, but also by the works of different cartographers all over the world (Thrower 1996).

In 1569, Gerardus Mercator created a cylindrical projection, which simplified the nautical navigation (Storr 1994; Thrower 1996). With this use of geometry, the technical knowledge and the geographic data for the production of maps, the science of cartography was introduced. Implementing order, structure and grids included not only credibility, but also effects the perception and use of the map (Cosgrove 2004: 50). The development from philosophical or religious contents shifted towards maps of the world, countries and cities (Faby&Koch 2006). With the standardized usage of grids and expressions, as well as the spatial reference, maps and its containing knowledge now became a public and universal instrument, which were accessible and readable to everybody. Here, the aspect of the invention of the book printing in the 15th century play an important role in the simple and wide distribution (Thrower 1996).

The so-called 'Scientific Revolution', starting in the beginning of the 16th century, led to a flourishing increase in cartography and other disciplines. With scientists like Galileo Galilei,

Edmond Halley or Isaac Newton, cartography was redesigned and continued. With the introduction of the thematic map, sketches of the moon and other celestial phenomena, the society was introduced to new knowledge and experiences (Thrower 1996). New founding associations, universities and schools but also the start of the publishing cartography helped to upgrade the social knowledge of those recent discoveries. Now, mapping involved and included new and different cultures and social groups (Faby&Koch 2006).

One example of this involvement may show the 'Noli Map' of John Snow. Since Halley, different social subjects and matters were mapped, e.g. population density, traffic-flow, but probably the most famous one is the mapping of the deaths of cholera in London, 1855. Thrower (1996) mentions: " Dr. Snow's maps illustrate highest use of cartography: to find out by mapping that which cannot be discovered by other means or, at least, not with as much precision." (152) With this mapping, cartography reached the point of illustrating and visualizing social problems or other phenomena, which are not visible and feasible on site. Maps became from then onwards an important factor in communication (with the society).

Arrived in the 20th century, cartography is still an important field of study. Many academic discussions lead towards a new perception of the role of cartography and maps, more functionality of the map (MacEachern 2004), critiques of standardized schemes, designs and orientation (Corner 1999), as well as the "normative models of (modern) cartography (Harley 1989: 1).

Today, maps transmit immense spatial knowledge to the users and are found in various implementations. Information about urban space is easy to access and allows individuals to perceive a broader picture of it.

Space in maps

Cartography produces maps and maps represent urban space. But how do maps present this space? The reproduced space often shows two characteristics: objective and abstract (Corner 1999: 215). The 'objectiveness' is created through the selection of spatial knowledge and portrays real structures, whereas abstract data give additional information to the map, "such as frame, scale, orientation, projection, indexing and naming reveal artificial geographies that remain unavailable to human eyes" (Corner 1999: 215).

Next to the pure 'objective' and physical purpose, maps also carry an agency and meaning. When a map is drawn, a lot of information are collected and presented - also those not visible to the human eye (Corner 1999): Experiences, situations and memories can be remembered by the view on a map and going along paths, the space and the urban lyric of the city becomes visible. The visitor can read new lines in a map/story, can explore unfamiliar spaces and a new world of words, signs, paths and cultural experiences will open up (Lynch 1960).

"The ordinary practitioners of the city life 'down below', below the threshold at which visibility begins. They walk – an elementary form of this experience of the city: they are walkers, Wandersmänner, whose bodies follow the thicks and thins of an urban 'text' they are able to write without being able to write it" (de Certeau 1984: 93).

Walking and filling the space with meaning, writing the lines of a map are a necessary step within mapping a cognitive understanding of space. The individual or urban wanderer chooses his own structure, direction through this poetic space and composes a new chapter in the way towards the solution (de Certeau 1984). So, another organization or route in space has been consigned and a new part of the urban map was created. In that way, the movement through the city and choosing new routes in order to experience allow the spectator to discover space and its representation through maps in a new way. Therefore, "mapping is particularly instrumental in the construing and constructing of lived space. In this active sense, the function of mapping is less to mirror reality than to engender the re-shaping of the worlds in which people live in." (Corner 1999: 213). Space can be 'reshaped' and maps are the tool, which is providing the material and information. Therefore, mapping space in the abstract sense allows the individual to communicate and take part in the process of restructuring and representing.
Every individual then perceives the mapped space in a different way, and can use this perception and knowledge for form a new model of a space (Faby&Koch 2006). This new form, the cognitive map, will be subject of the following chapter.

2.4. Perception of Space in Maps

With the main form of representation of space – the map – in mind, this chapter focuses on the notion of perception. How is space, represented on a map, perceived by a human mind? What processes take place and what are the consequences? This chapter studies the perception of space and its resulting influence on spatial behavior.

Perception of space

Since the early 20th century, cognition and perception of space in the human mind were awakening topics in the fields of psychology. Mark et al. (1999) give a short overview of the early beginnings of this research and summarize its development from initial experiments with 'cognitive maps in rats' to later theories of 'memory of spatial relation' (6). In the 1960's, research in behavioral geography also included geographer and cartographer in the science of cognition and has been well presented by the work of Lynch (1960) "The Image of the City". With this publication, known theories were combined with new practices and enlarged to various fields (Mark et al. 1999). Since the 1970's the attention was given to cognitive maps, which derive from the perception of spatial knowledge and memories in the human mind. Since then, cognitive maps are field of study and topic of discussions, as well as important for the use and design of cartographic maps (Downs&Stea 2011; Mark et al. 1999; Lloyd&Steinke 1984). Even today, psychologists, geographers and cartographers are amongst the researchers. Whereas psychologists are dealing with the theoretical processes of the cognition and storage of spatial knowledge, geographers and cartographers analyze the consequences and results of those theories (Lloyd 1989).
With the fast development of technology, the interest of behavior cognition grew also towards computer-based systems and visualizations. Thereby, the cognitive knowledge and behavior was integrated into programs to improve the visualization and perception of cartographic products (Mark et al. 1999)[3].

For this study, cognitive maps are the key to understand, how space is perceived in the tourists mind and gives the opportunity to inspire interpretations on the image (in the commercial meaning of branding, marketing) of a city. Therefore, this chapter is devoted to the notion of cognitive maps and leaves out the current development of technological

[3] See here the development of GIS, Geographic Information System

improvements or use of cognitive maps in the computer science. Only later, in chapter 4 & 5, the mental maps of the empirical research are analyzed and interpreted.
Before dealing with the phenomena of cognitive maps, the first step of perception of space shall be illustrated.

Perception can be described in many different ways, but all explanations deal commonly with the notion of observation, apprehension and comprehension. Downs & Stea (2011) define perception as "the process that occurs because of the presence of an object, and that results in the immediate apprehension of that object by one or more the senses"(314). Therefore, the reaction to noticing or dealing with an object, building, person or a map is followed by the storage of this information in the mind. The storage center in the brain, the so-called hippocampus perceives all knowledge and can then create a reproduction or representation of the new-gained information (Eichenbaum et al. 2004). With the focus on spatial perception, the representation of the spatial knowledge in the hippocampus would then be called "cognitive map" (Down&Stea 2011; Lloyd 1989; Eichenbaum et al. 2004). This cognitive map - as well as all other spatial knowledge, information, representation or general perception – varies from individual to individual and can differ in its accuracy, extension and storage duration (Lynch 1960).

In short, perception of space is leading to a picture in our mind, the cognitive map. The following chapters will focus on the definition of cognitive map, its theories and distortions.

Cognitive Maps

To specify the notion of cognitive maps, the distinction of mental or cognitive image and mental or cognitive map shall be made. Afterwards, the cognitive map will be characterized and defined. Before, the distinction between cognitive maps and mental maps will follow: in the present literature, cognitive and mental map are used similar if not with the same definition. In this study, cognitive processes and its resulting creation of a 'map' will be considered as the 'cognitive map'. Later, especially in chapters 4&5, the mental map shall refer to the product on paper, which means, the former cognitive (imaginative) map will turn (verbally) into a mental map as soon as the map is drawn on paper.

Peterson (1987) describes mental images and maps as "products of spatial thinking and [which] are dependent upon the process of arranging objects in space" (in MacEachern 2004: 46). Both perceived products represent knowledge about the environment but differ in their consequences in spatial behavior (MacEachern 2004; Tuan 1975). An image can be defined as "mental picture in the memory" (Tuan 1975: 205), "which specifies the locations and values of configurations of points in a space" (Pylyshyn 2003). This representation of spatial information can therefore be understood as a picture, an idea of space or object with knowledge about location. Further interpretation or consequences for spatial behavior are non-existent with a cognitive image. Only the cognitive map allows influences in activities in real space.

Cognitive maps represent the "process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls and decodes information about the relative location and attributes of phenomena in his everyday spatial environment." (Downs&Stea 2011: 312). In other words, a cognitive map describes the representation of the environment with information about location, attributes and direction. This amendment of allows being influential on spatial behavior (Downs&Stea 2011; Lloyd 1989; Tuan 1975). Everyday decisions about ranging from travel to work/school, doing groceries, leisure, as well as all other activities in space, are manipulated by the cognitive map (Lloyd 1989). Every individual perceives space and creates mental pictures differently, so that every cognitive map is personalized. Down&Stea (2011) refer to cognitive maps as "complex, highly selective, abstract, generalized representations in various forms" (315) as well as with an "incomplete, distorted, schematized and augmented" (315) character. Cognitive maps are consequently a simplified, fragmented, subjective representation of the real space. Therefore, this spatial knowledge stored in the human mind can influence and manipulate every individual daily processes in space differently.

Still, the reader should keep in mind that this cognitive map does not function as a cartographic map. The cognitive map remains a fragmented picture of the real world, "but not necessarily the physical properties of such a pictorial graphic model [cartographic map] (Downs&Stea 2011: 313).

As mentioned, cognitive maps are only a selective and fragmented picture of the environment and lead therefore to various distortions. The next part will explain the research of distortion and explain the consequences for the representation of space in mental maps.

Distortion in Cognitive Maps

In every cognitive map, as it is a simplified representation of spatial knowledge, errors and mistakes in various forms, can be found (Tversky 1992). The mentioned characteristics of a cognitive map lead to distortions in memory and can have a great influence of the human action in space. Distortion is defined as "cognitive transformations of both distance and direction, such that an individual's subjective geometry deviates from the Euclidian view of the real world." (Down&Stea 2011: 315). Hence, the human mind modifies the mental information regarding distance and direction and influences hereby the spatial behavior. Tversky (1992) examines the production of distortion and determines a schematic process: errors occur at mainly three different steps, when "the human mind reorganizes spatial information, first through hierarchical organization or categorization, second through the use of perspective, and, third through the use of landmarks or cognitive reference points." (131). In line with Tversky (1992), also Downs&Stea (2011) mention the emergence of distortions due to schematization (315). In various ways this systematic order of information lead to misjudgments of distances and locations in the cognitive map.

Tversky (1992: 133/134) mentions the following cases exemplifying the distortion appearing through the schematic storing process:

— Buildings, objects, cities are categorized in hierarchical way (Hierarchical Organization)

— Overestimation of distance between cities close to used perspective (Cognitive perspective)

— Only landmarks decrease distance to other buildings (Cognitive Reference Points)

Additional to the different distortions, Lloyd (1989) makes the distinction between the intensity and frequency of distortion depending on the spatial knowledge. He hereby recognizes two ways of gaining spatial knowledge: through navigation and a cartographic map. Whereas the 'navigation knowledge' is perceived through actual contact to the city space and results in a fragmented picture, the 'map knowledge' achieves a whole image and general overview of the city. Also, in the study of distortions in cognitive maps of those two samples, Lloyd (1989) examines differences. Whereas individuals, who gained knowledge through navigation, "were unable to perform the task as efficiently or as consistently as subjects who had learned the "same" distribution of landmarks from studying a cartographic map for a short time. Subjects who had learned the locations from a cartographic map

performed the task significantly faster (…) to determine the landmark locations (…) [as well as] significantly more accurate in their estimates of landmark locations" (122). Lloyd demonstrated hereby the variation in distortion, when the spatial knowledge is perceived in different ways. As this thesis is dealing with the spatial knowledge of tourists (see chapter 4&5), the sample group 'map knowledge' would represent this research and the occurring distortions.

Mental Maps

This research deals with the representation and perception of mapped space and therefore analyzes mental maps of tourists in two different case studies. This chapter will examine the differences of mental maps to cognitive maps and will give the guidelines of Kevin Lynch towards the reading of a mental map. In his work "The Image of the City" (1960), Lynch presented noteworthy city components, which are used for people to express their cognitive map on paper. The product, the mental map, therefore can be classified into different categories and gives information upon the perceived city image.

Lynch (1960) noticed a structuring of the city form into five elements: paths, edges, districts, nodes and landmarks (p46). *Paths* therefore describes those trails, people use to move in space. The street is probably the most used path and represents the dominant orientation element of long-term residents in a city. *Edges* are characterizing boundaries or invisible walls in a city, which occur between areas or neighborhoods. Water, change of architecture, or actual walls can symbolize edges. *Districts* can be seen as a synonym to neighborhood or area within a city, the similarity of certain characteristics, history, and attributes must exist. *Nodes*, literally translated can be seen as the meeting of several paths. Also, at the borders between different districts, nodes can emergence. Hereby, a big crossing, a major traffic junction, a round about, a big square or parks would exemplify this city element. *Landmarks* stand for single objects of which the city can be represented. This typical element of the city sticks out with its iconic and unique character. Examples can be the Eiffel tower in Paris, the Stephansdom in Vienna, or the Atomium in Brussels (Barthes 1997a; Lynch 1960).

The perception and importance of those mentioned city elements vary amongst groups. Lynch mentions regarding the orientation the importance of landmarks to tourists, but paths to residents. Pearce (1977) was arguing against this notion, when he was analyzing mental maps of tourists in Oxford. Here, the number of paths did not improve with an

increase of the duration time. In his study, landmarks were still more important to the tourist, even though with an increase of the visiting time. This outcome may differ to Lynch's proposition, as the sample group of both researchers was different (Lynch: residents; Pearce: tourists).

However, this thesis will also examine the difference in perception of space, depending of the stay duration. The analysis of those city elements and mental maps allow then the interpretation of the city image. Lynch (1960: 86) mentions different levels of image – creation, from the street-image to the city-image. This thesis will focus on the level of the city and will give a more holistic approach to the notion of the 'image'.

2.5. Conclusion

The concepts of space from different philosophical and sociological authors introduced the focus of this thesis. Space is shaped through society and physical structures, and since ancient times, the human kind tries to represent it on materials. The history of cartography therefore examined the importance of maps in society and its development until today. Maps play an important role in the nowadays life and serves multiple applications, mostly for orientation. The representation contains spatial knowledge, and can be perceived by the human mind, which stores them by creating a cognitive map. This map is an individualistic agglomerate of different information and contains subjective knowledge about the environment. Distortions can derive and do have a great influence on the spatial behavior of the individual. When translating the cognitive map into paper, a mental map has been generated and consists, after the theories of Lynch (1960), out of five different city elements. With the analysis of those elements, the city image can be studied and allows interpretation.

3. Methodology

Through empirical research and in-dept study of the two case studies Brussels and Warsaw, the research question, 'How is the spatial experience of a city map reflected in the perceived images of this space?' shall be analyzed and discussed.

In chapter 2.4 the development and processes of cognitive perception of space was elaborated and presented the main ideas of cognitive psychology and geography. This thesis is dealing with the section of behavior geography and the social empirical research and will not develop cognitive psychology any further. The method used in this research is based on empirical studies with qualitative questionnaires and semi-structured interviews.
To understand the present methodology, a short overview and introduction in maps will be made with the chapter 3.1. Following, the focus of the second part lies on the two case studies Brussels and Warsaw, the general city description and in depth study of the explored maps. The third part then will clarify the used methodology of this thesis.

3.1. Background: Maps in detail

For a better understanding of the following empirical research, a desktop study with different maps will be made. Hereby, two different types of maps were chosen to be analyzed and studied according their cartographic structure and characteristics. Later, the difference between the both map types shall be studied and develop a basis for the research.
The first sample contains five tourist maps, which are all available at the main tourist offices in the following cities: Brussels, Copenhagen, Munich, Vienna and Warsaw. Those city maps were chosen partly randomly (Copenhagen, Munich and Vienna) and with purpose (Brussels and Warsaw), as those official tourist maps are from the case study cities. The second map is the 'USE-IT map' where again five different cities were chosen and studied into detail. For a more precise and comprehensive idea and explanation of USE-IT, please see chapter 3.2. Here, the maps of the two case studies, Brussels and Warsaw were selected, as well as maps of randomly chosen cities: Dresden, Turin and Vienna. Those additional maps shall give a better overview of the techniques and information of the respectively map design with the purpose of achieving a more holistic picture before starting to analyze the case studies into detail.

According to Hardy&Field (2012) "a good map has elegance and style, clarity, and meaning, as well as appropriate content to the necessary level of precision and detail" (325). Hence, on those criteria, as well as on Lynch's (1960) city components this chapter will focus on. Although elegance and style are not objectively measurable, it will be part of this analysis, as the difference between the 'tourist map' and the 'youth map' shall be clarified. The goal of this study is to understand the results of the mental maps in the empirical research (see chapter 4 & 5). Those detailed analyses shall exemplify the grounding information and points of reference for the later interpretation. Therefore, the tourist maps as well as the USE-IT maps shall be evaluated by their cartographic comprehension and representation skills.

First, an explanation of the presented various aspects of cartographic information shall help to understand the particular maps and later their influence on the perception. 10 different questions were asked and analyzed:

- *Name*: Names are given to reproduce this methodology and designate the used map.
- *Distribution*: In order to understand the availability of the particular map, the information of the distribution is given. This information shows the possibility of tourists to get those maps.
- *Number of maps*: The number of maps within one city map will be counted and its content presented. The variety and focus, as well as detailed spatial information are hereby of priority.
- *Overview*: An overview can help the tourist to gather a holistic picture of the city, let the person see the city in correlation with its country or surroundings. In this analysis, the existence of an overview wants to examine, whether a broader picture of the city within its surroundings is present.
- *Additional information*: Further information, like location of tourist offices, hostels or hotels, as well as alternative transport possibilities, local magazines or guides for local behavior can be presented on the map. That information can help a tourist to orientate and behave easier and adapted in a new city, as it is not only spatial but also social knowledge given.
- *Landmarks*: This first 'city component' (Lynch 1960) displays a very important and visible orientation within the city but also on the map surface. As mentioned earlier, tourists orient almost only upon landmarks. Therefore, the visible and highlighted

sign on a map can indicate, whether the tourist can navigate and remember those places.

- *Paths*: Streets, when a self-guided tour is lead through it, can draw more attention or importance. Grabler et al. (2008) mention the combination of different transports (public transport and walking) in the movement of tourists. Thereby, the included signs of public transportation within the map can facilitate the orientation of tourists.
- *Nodes*: As Pearce (1977) depicts, nodes "are used by Lynch for his residential sample and they do not "translate" or make particularly good sense for tourist groups." (206). Still, parks or other enclosed squares can be visible on a map and shape a cities image.
- *Edges*: Another city component of Lynch can help to overlook the city and classify the city image in different parts. As edges are most likely rivers through the city, or big obstacles, one can orientate upon those.
- *Districts*: Different districts can characterize the city in various forms. Therefore, it is important to present different districts of the city and give thereby a completely image of a city.

Tourist Maps

The following part presents the analysis of five mentioned official tourist maps and is organized by a division between basic information, content, the maps itself and the readability. Tourist maps are offered and mainly sponsored by the city government. Most of those maps are available at tourist offices or information stands (Brussels, Copenhagen, Munich, Vienna and Warsaw), or can be found online for self-printing (Munich, Warsaw). Other cities, such as Copenhagen and Vienna provide their city maps only in the printed version, due to license restrictions or other reasons (see email-contact Tourist Offices). The prepared table is a short description of the respective map and displays the main aspects of the subjects: name, distribution of the map, number of maps, overview over the city, additional information (e.g. self-guided tours, information about history, districts), as well as the city components mentioned by Kevin Lynch: landmarks, paths, nodes, edges, districts. The latter notion shall clarify the existence of those components already in the map. Hereby, the knowledge of the city can influence the mental map and the image of the city.

The following table presents the analysis of the official tourist maps in Brussels, Copenhagen, Munich, Vienna and Warsaw:

Aspects	Brussels	Copenhagen	Munich	Vienna	Warsaw
Name	City Map VisitBrussels Sized for Walking	Copenhagen CityMap	City Map	City Map & Museums	Warsaw City Map
Distribution	Tourist Information, Price: 0.5 €	Tourist Information; Hostels; Hotels. For free	Tourist Information. Price: 0.4 €	Tourist Information, Hostels, Hotels. For free	Tourist Information. For free
Number of maps	6: overview, city center, public transportation, 3 neighborhoods	4: overview, city center 4??	5: overview, city center, city, public transport, other destination,	4: overview and city center	5: historical center, 2 districts, city, centered part Warsaw
Overview	yes				no
Additional information	3 self-guided walks, street directory, no adverts	district description, self-guided tour: info about buildings+ history, landmarks	selected landmarks with info & directions & numbered, no adverts	info about Museums& Sights; Services & Info about Vienna, tours	3 self-guided walks, info about landmarks, general info, direction to airport, no adverts
Landmarks	3D signs & name, numbered in street directory	2D signs & name; numbers connected to advert	2D signs & names, with info	3D signs & names; names bad readable	2D & names
Paths	self-guided tour, streets, public transport	self-guided tour, streets	different street types, public transport, pedestrian street	different street types, public transport	different street types, public transport
Nodes	Parks, squares	Parks, squares	Parks, squares	Parks, squares	Parks, squares
Edges	big street with trees (pentagon), river	River, canal, railroad	streets, river, forest (?)	big streets, river	big streets, river
Districts	3 districts on separate maps, others marked by name	Different colors & names & description	one district on separate map, others marked by name	one district on separate map, others marked by name	one district on separate map, others marked with name

Table 3:1 Analysis Tourist Maps (source: different official city maps)

Distribution: Tourist maps, which are available at the tourist information desks or at hotel receptions, are mainly produced by the government and some are provided free of charge.
Number of maps: The analysis of the official tourist maps showed, that the main focus of the map is on the city center. However, all maps are equipped with an overview of the whole city structures and surrounding neighborhoods or train/road connections. Public transportation map is mainly separately displayed and available in almost every tourist map, as well as drawn in the map itself. Further, additional detailed maps about specific neighborhoods can be found in some maps to present typical areas or guided tours.
Overview: Except Warsaw, all official tourist maps allow a holistic picture of the city with the provision of an overview. Those can vary between the relation between the whole city and its surroundings (e.g. Copenhagen, Munich) or the official city boundaries. Warsaw only presents a limited view with focus on the main, centered section of the city.
Additional Information: most maps are providing the tourists with additional information about their city. Self-guided tours, information about tourist offices/services, alternative transport (bike, taxi, etc), museums, hotels and landmarks are given in all tourist maps. Moreover, the map of Copenhagen describes in a short sentence the mapped districts and

separates them through different coloring. In some cases (Brussels, Copenhagen, Vienna) advertisement is an essential part of the map design, which might allow the free distribution.
Landmarks: All tourist maps show the main landmarks as a 2D or even 3D image and increase their size to stick out to the tourist's eye. Some of the landmarks are furnished with the name of the object, and/or present a number, which is connected to a descriptive section.
Paths: In most city maps, streets are characterized with intensity (through different colors) and their names. Further, signs for public transportation are included in the street maps. Further, the intensity of traffic and importance of a street is in most of the maps indicated through changed color use and/or difference in size.
Nodes: In all cities, nodes are represented by the notion of parks and squares. Parks are highlighted with a green coloration, whereas squares are indicated through their name and the crossing of some streets.
Edges: By looking at the various maps, edges can be spotted out. Mostly rivers, big streets or railroads are cutting the overall city image and signalize a boarder. With different colors (river = blue, forest = green, railroad = black-white), those edges are designed and marked.
Districts: Except Copenhagen, all tourist maps present the different districts with their names and one or multiple neighborhoods on a separate map for detailed study. Hence, no area limitation is presented in those maps, whereas the tourist map of Copenhagen highlights the limits of the districts through different colors. Also in that map, a short description of the respective districts is displayed.

How are those maps now representing space? What do tourists read and remember from those maps?
The mentioned official tourist maps are created for all types of tourists and deliver a very basic and general picture of the city. The most visible and essential factor in all maps is the landmark, which correlates with the notion of Lynch (1960) and Pearce (1977) of the importance of this city component for the orientation of tourists. Tourists therefore navigate on the basis of landmarks (Grabler et al. 2008), and will remember them the most (Lynch 1960; Pearce 1977). With 2D or 3D signs, the landmarks are signalized and highlighted and oversize in all cases the used scale. Further, most of the information and descriptive sections are related to the landmarks, as well as self-guided tours mainly direct tourists to the most important objects.

Consequently, a 'landmark-dominated' mental map could characterize the perception of those official tourist maps. Landmarks also characterize the cities, which are sometimes

previously associated with one particular object: the Atomium, Brussels; little Mermaid, Copenhagen; Frauenkirche, Munich; Stephansdom, Vienna; Palace of Culture & Science, Warsaw. If tourists can combine those objects to the respective cities even before their visits, those objects are generating a so-called emblem – or landmark of the city – status. Streets are marked with their names and are used for indirect orientation. Those paths direct to the landmarks and are only used for navigation but not orientation (Lynch 1960; Pearce 1977).

The empirical research of this thesis analyzes the mental maps and its characteristics. This desktop research showed the importance of landmarks in their value of orientation and emblem, as well as streets for the use of navigation. With the hypothesis in mind, the USE-IT map will be focused on in detail and its interpretation and studies the tourist's perception of space. This question of the city image in mental maps shall be answered in chapter 5.

USE-IT Maps

The second step towards the empirical research and the analysis of mental maps is the description of the USE-IT maps. Here, an analysis regarding the content and structure of the maps will be applied, further information about the USE-IT map itself and its ideas can be found in chapter 3.2.

Five different USE-IT maps were selected and analyzed according the previous schema. Again, Brussels and Warsaw as the two case studies were chosen and will be presented next to Dresden, Turin and Vienna. As the USE-IT map does not exist in all cities, 3 different cities were selected as in the study of the tourist maps. Hereby shall be noted, that the direct comparison between an official tourist map and its complement USE-IT map is only relevant for the cities of Brussels and Warsaw. The other cities, as already mentioned, are serving only for a more descriptive and representative picture and research.

The next table will show the analysis of the different USE-IT maps according to the already applied aspects and components:

Aspects	Brussels	Dresden	Turin	Vienna	Warsaw
Name	Brussels - Free map for young travellers (2012)	Dresden - The young map (2011)	Torino - Free map for young travellers made by locals	Vienna - Free map for young travellers made by locals (2012)	Warsaw - Free map for young travellers (2012)
Distribution	Youth hostels, USE-IT Office. For free	Youth hostels, Tourist info, Train station, Uni, event For free	Youth hostels For free	Youth Information, Tourist Information, Erasmus office FH, Hostels, festivals. For free	Youth hostels, Hotels, Cafes For free
Number of maps	4: surroundings, city center, city, public transport	5: surroundings, historical center, districts of town, district „Neustadt", party zone	2: city, city center	4: city, city center, district numbering, public transport	7: centered part of city, 6 districts: Praga, Powiśle, Żoliborz, Saska Kępa, Śródmieście Południowe, Mokotów
Overview	yes, within Flandern	yes	no	no (but almost whole city)	no
Additional information	3 self-guided walks, detailed description of landmarks, info about tourist offices, behavior (act like a local)	party zone, tourist info, info about USE-IT, surroundings, events, behavior	2 self-guided walks, detailed description of landmarks, info about city history, transport, behavior, tourist info, events	1 self-guided tour, tram-tour, detailed description of landmarks, info about transport, coffeehouse culture, districts	Practical info, info about transport, different districts, events, tourist info center, money, galleries
Landmarks	2D signs & name & numbers with description	3D signs & pictures & numbers with description	2D signs & numbers with description	3D signs & numbers with description	3D signs & numbers with description
Paths	self-guided tours, streets public transport	streets, public transport	self-guided tours, streets,	self-guided tour, streets, public transport	streets
Nodes	Parks, squares	Parks, squares	Parks, squares	Parks, squares	Parks, squares
Edges	metro, river (pentagon)	river, railroad	rivers, railroad	river	streets, river
Districts	historical center is colored, but no names	only 3 mentioned	not marked	not marked (only on extra map)	6 districts named & marked

Table 3:2 Analysis USE-IT Maps (source: different USE-IT maps)

Distribution: All USE-IT maps are distributed for free amongst youth hostels. Hereby, the quantity and totality of distribution is still varying (Interview NM 2012, Interview SZ 2012). Brussels is serving all youth hostels with their USE-IT maps, whereas the USE-IT map in Warsaw does not reach all youth hostels. Also, the existing USE-IT office offers the same 'tourist information' function and distributes USE-IT maps. Further, at youth information, events, hotels or cafes, the USE-IT map can be found. *Number of maps*: the historical center of each city can be found in all maps. Thereby, the number and detailed information of maps are varying. Turin is only presenting two different maps, whereas one is concentrating on the historical center, the second one zooming a bit further out of the city. Contrasting, Warsaw offers 7 maps with focus on details of six different neighborhoods. The main map therefore presents the centered part of the city, but the historical center is not especially marked.

Overview: Brussels and Dresden allow the visitor to see the city in a broader context. Hereby, Brussels maps the relation and connection between Brussels and other Flemish

cities; Dresden is offering the city limits and the location of the mapped neighborhoods. The other USE-IT maps only present a narrow view on the city, whereas mostly the centered part of the city is portrayed.

Additional Information: All maps provide information about the 'local behavior' in the particular cities, as well as hostel and other tourist information. Some maps (Brussels, Turin, Vienna) offer self-guided tours, magazines with the latest events (Dresden, Turin, Warsaw), as well as about the history, transport or other destinations.

Landmarks: The uniform design of the USE-IT maps presents landmarks in 2D, or 3D sign, which are all equipped with a description.

Paths: Through self-guided tours, selected streets are highlighted. Also, the emergence of public transport may increase the value of a street. All streets are displayed clear and are provided with their names.

Nodes: Similar to the official tourist maps, parks and squares display nodes. Hereby, the green color indicates parks, whereas squares are mentioned by their name.

Edges: All analyzed cities are characterized by the presence of a river, which can be seen as an edge. Further, the railroad is highlighted in different colors and may be experienced as edge.

Districts: Warsaw, with its 6 additional maps of the different neighborhoods is the only map, where districts are highlighted. Also in the general city map, colored spots represent the location of the districts. The other USE-IT maps did not specify the existence of different districts by name, only within the descriptive text.

To sum up, the USE-IT maps represent the city space through a wide range of selected items. Important landmarks, but also paths, districts or social behavior are part of this map and guide a tourist through the city while "acting like a local". The target group of this map is among young travelers; therefore this city map can be found at various youth places, like hostels, cafes, and events or even at the University.

The city image leaves the 'landmark-dominated' level as the map provides additional information, like self-guided tours or other descriptions. The highlighted numbers or descriptions do not all refer to only landmarks, but also as mentioned to paths, districts, events, etc. Hence, the perception of city space through a USE-IT map could be of a more informative and varied character, than the one of the tourist map.

Despite a similar cartographic city map, the information given on the both studied map differ immensely. The tourist map keeps its descriptive section limited to museums, official

tourist services and public transport, as well as in some cases advertisement. Contrasting, the USE-IT map provides a different picture with additional social and cultural information. Herewith, those 'young maps' can be seen even as a cultural guide through a city and could therefore achieve a more advanced perception and resulting city image.

3.2. Case Studies

Case studies serve to understand and be able to compare different and complex outcomes and results, but also allow a greater and richer information quantity to cause a more complex picture of the research (Bryman1989; Mabry 2008).
For this research, two case studies were chosen to provide a detailed description and in-depth analysis. Time and money restrictions, as well as the constrained scope of this thesis limited the research to only two case studies. The USE-IT maps of Brussels and Warsaw were selected to answer the question of perception of mapped space. Hereby, both case studies help to understand, what mental image maps can create in the tourists mind. This chapter is characterized by the description of USE-IT map and its organization, as well later by the analysis of the two case studies.

Overview: USE-IT map

USE-IT is a non-profit organization, which is financed through subsidies from the city government, region or other governmental institutions (USE-IT, 2009). The philosophy behind the USE-IT organization is to provide free and useful information and instructions to young travelers in order to visit and see a city through local eyes. USE-IT claims to present places and localities, which are: authentic, special, extraordinary but ordinary, specific, local, unique, cheap, or centered in the city. For young travelers with a small budget, who want to experience a new city, this map offers advises and guidance of local people (USE-IT, 2009).
The organization behind those local maps is called USE-IT Europe and consists out of all sub-organizations, which are responsible for USE-IT map in the respective cities. At the moment of this thesis (01.09.2012) 22 USE-IT maps in 14 different countries are available, while more maps will follow. Since 1971, this map has been developed, when Copenhagen, Denmark started with a small guidebook about the cheapest sleeping places and restaurants.

From that moment onwards, USE-IT grew to an international network but stayed always with its principles, which is collected in a so-called "Charter":

1. The information provided by USE-IT is complete, up-to-date and based on the needs of young people and travelers
2. The information provided is free of charge.
3. The information consists at least of a minimum of (alternative) tourist information, cultural events, where to sleep, where to eat, information where to go out and where to meet other people.
4. There will be information available that enables young people and travelers to explore a city without being dependent on others.
5. The information offered is clear and independent of any religious, political, ideological or commercial influence.
6. USE-IT is intended for young people and travelers.
7. USE-IT will be non-directive and adapts a personalized approach.
8. USE-IT will be as innovative as possible.
9. USE-IT enables and stimulates young travelers to meet their counterparts.

Table 3:3 Charter USE-IT Europe (source: USE-IT 2008)

Here, the philosophy as well as the guidelines and rules of the USE-IT organization are presented. This charter has to be followed by all USE-IT sub-organizations and guarantees the consistency, values and idea behind USE-IT for all city maps. Next to those guidelines, the USE-IT network has an equal power distribution, and not a hierarchical company structure (Interview NM 2012).

Differences to other young travel guides or maps are seen in the local advices, as e.g. Lonely Planet. Those guidebooks also focus on the young travelers and may also include maps, spatial and social behavior on a 'low-budget-philosophy', but whereas the USE-IT map is written and updated yearly by locals (Interview NM 2012), the Lonely Planet is receiving their information from foreign authors visiting and experiencing the places themselves (Lonely Planet 2012).

As mentioned in chapter 3.2, the USE-IT map offers many descriptive parts in its structure and differs thereby from other maps for young tourists (see e.g. Lonely Planet maps, CitySpy maps). Following "the Charter", no commercial purpose or any advertisements are present on the USE-IT map.
Also, the design of the different USE-IT maps is unique and is been changing every year, with each city creating their own style. The cover picture represents with an ironic or

humoristic way the city image or symbols and creates a 'young picture' of the city. Those symbols then will be explained through a short text or other comical strips.

Picture 3:1 Cover USE-IT maps (source: USE-IT maps Brussels, Warsaw, Dresden, Turin, Vienna)

In a short section, the history, bad reputation, specialty and useful information for tourists are displayed and give an overview of the social culture of the city. All maps are available in a folded version and attract through colorful design. The following picture shows the front pages of the five mentioned USE-IT maps, Brussels, Dresden, Turin, Vienna and Warsaw.
Hereby, all maps present a short statement of their city image, e.g. inventions (Dresden), city landmarks (Turin) or culture and the social picture (Vienna). A detailed description of the maps of Brussels and Warsaw will follow in the next chapters.
Connected to this visual sketch of the city image, a section of "Act like a local" provides helpful information about culture, society and city structure. Those texts guide the tourist through the city with additional local help and warn about tourist traps or too commercial places. Also, social specialties, hostel and transport recommendation or the image of the

inhabitants are objects of this passage, as well as useful travel hints. Then, every map is structured differently: some are presenting different neighborhoods into detail (e.g. Warsaw), others only certain city parts (e.g. Dresden) or the bigger city context (e.g. Vienna). Still, the city center is marked on all USE-IT maps and provide information about different places, landmarks or objects. Detailed local advices (suggestion, recommendation, information) next to descriptions of 'tourist classics' characterize the picture of those maps and give short guidance to the spatial information.

Although local suggestions dominate within the composition of the USE-IT maps, famous landmarks and tourist attractions are mapped as well. Guidelines of sponsors (Interview SZ 2012) or demand of travelers (Interview NM 2012) oblige the USE-IT organizations to include touristy places. Therewith, a broad spectrum of highlights can be offered and serve a bigger variety of young travelers.

Despite the differences in design and composition, many maps share cartographic details: similar font, organization or arrangement of the maps can be found in many maps and accomplishes recognition factor but also facilitate orientation. Although every USE-IT team is creating and designing its own map, guidance is available from the USE-IT Europe organization (Interview NM 2012).

Case Study 1: Brussels

The USE-IT map of Brussels was chosen to be the first case study. As center of the Belgium USE-IT network, the map of Brussels offered many reasons for this decision. The long history within USE-IT, as well as a permanent USE-IT office allows a detailed analysis and facilitates the access to the management and young travelers.

City background Brussels

Brussels functions as capital of Belgium, Europe and for the Flemish region as well as host for the administration of the Brussels region. The Brussels region is composed of 19 different neighborhoods, whereas Brussels-Ville contains the historical center. Within the region the population counts more than one million, whereas almost 50% of the population born in Brussels was not of Belgium nationality (Deboosere et al 2009). This figure shows the multinational combination of the population and its influence in the resulting culture mixture. Also, throughout history, Brussels was center of many wars and battlefields but

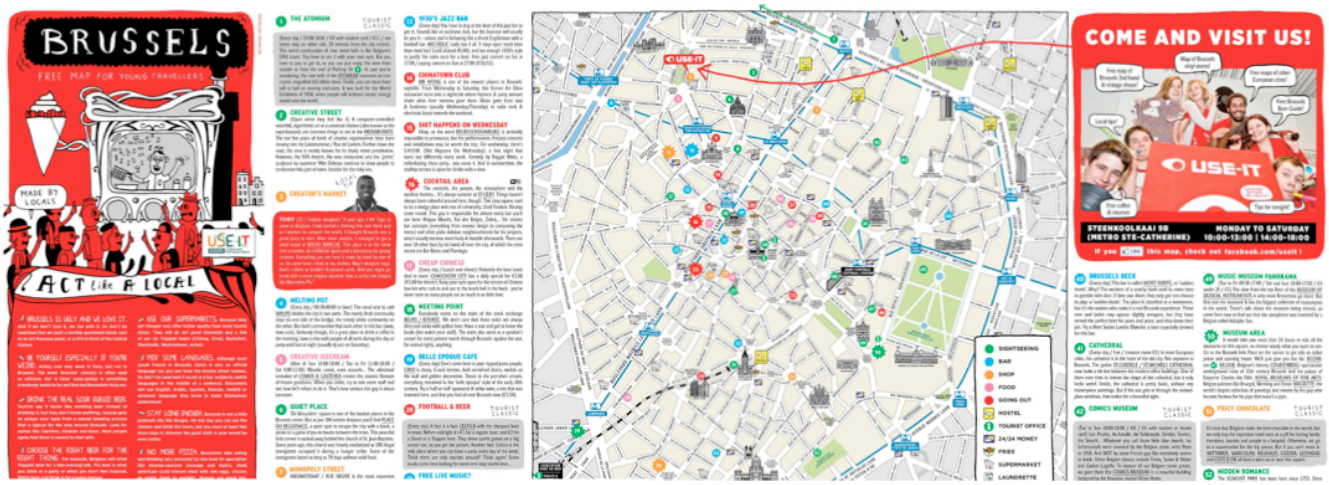
also melting pot of various cultures, societies and other heritages. "This historical and political, cultural and administrative complexity of the city is reflected in its present structure, image and organization." (Jansen-Verbeke&Govers 2008: 142).
Nowadays, many different museums, restaurants, landmarks, parks, squares and architectural highlights or other cultural heritage are spread over the city and can provide insight of this contrasting and rich culture (Jansen-Verbeke&Govers 2008). Every year five million[4] tourists are visiting the city of Brussels and discover the highlights of this city (IBSA 2012). Domestic tourists are not included into this figure, as they are visiting Brussels only for one day for e.g. shopping or leisure (Jansen-Verbeke&Govers 2008).

The USE-IT Brussels Map

In 2003, Brussels began to publish the USE-IT map of Brussels. Sponsored by the Flemish Government, 'Visit Flanders' and the cities of Antwerp, Bruges, Ghent, Mechelen and Leuven. Since 2008, a permanent office for young tourists could been installed in the city of Brussels and offers not only maps of the whole USE-IT city network but also functions as a 'normal' tourist office: information about the city, hostels, internet etc. This addition allows the USE-IT organization to interact and communicate directly with young travelers and react spontaneously on requests or feedback. Local suggestions regarding restaurants, places, museums, events or other highlights are not only given on the map but can be exchanged additionally through this office.
The USE-IT map is updated and changed its design every year since its first publication. But not only the front page and the color design varied, also the cartographic focus and map structure. In 2007 the city center was presented on one map and six different parts of neighborhoods. With the next map in 2008, the division between neighborhoods was dissolved, but the city separated in 2 parts: north and south, each on another side of the map. Since 2009, the structure of the city map has been kept: two big maps, one focuses on the city center, the area of Brussels-Ville, the other map shows the bigger context of the city and parts of the surrounding neighborhoods. This way, the orientation and overview has been achieved and only modified in style and design. The following description of the USE-IT map of Brussels is referring to the 2012 edition, as this thesis and the empirical research have been done in 2012 regarding to this map. Even if questioned young travelers would have been used another edition of the USE-It map, its content and mapped items and objects do not differ in that amount to endanger the validity of this research.

[4] In 2010, 5.256 million overnight stays were registered in the Brussels Region (IBSA 2012).

The first page of the Brussels USE-IT map (see picture 3.2) contains information about social behavior (Act like a local), as well as tourist offices.



Picture 3:2 Front page Brussels (source: USE-IT map Brussels 2012)

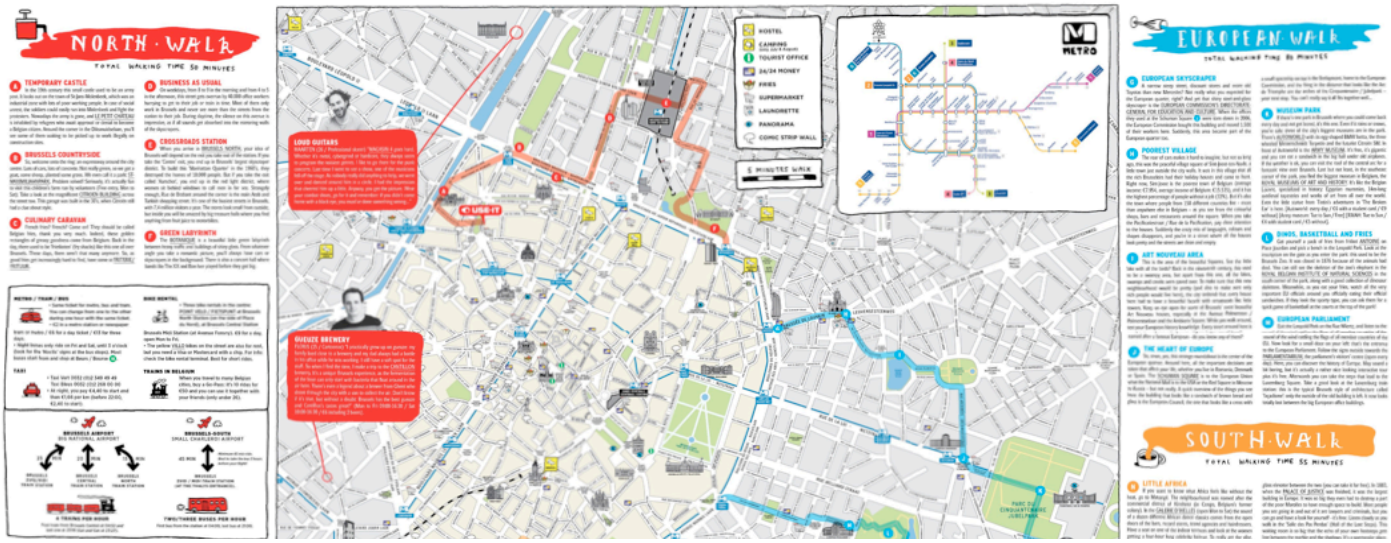
Further, the city center with information and descriptions of marked landmarks and local suggestions are mapped. In the middle of the first page, the historical center is visualized and marked with 2D landmarks and colored numbers. Those numbers are linked to short texts with information about the objects. Those objects are divided into five categories: landmarks (green), cafes/bars (blue), restaurants/markets/food stores (pink), shops (orange) and clubs/leisure (red). Additionally symbols of hostels, tourist office, cash machines, fries stores, supermarkets and launderettes are marked on the map. Also a pedometer, which shows the distance for a five-minute-walk, is a component of the legend.

Every description contains administrative information (opening hours, location) but also characterizing headlines, local stories or suggestions. Some of those descriptions are specially highlighted with notions like 'tourist classic' or 'local tip'. 'Tourist classics' indicate famous landmarks (Atomium, Manneken Pis, Grande Place, Comic museum) or touristy bars/restaurants. 'Local tips' therefore present suggestions made by young inhabitants, who give a short description about their favorite place:

Picture 3:3 Tourist classic vs. local tip (source: USE-IT map Brussels 2012)

To create a relation between young travelers and that local person, its name, profession and age are given and a picture presented. Hence, this 'local tip' connects the spatial information with social knowledge and story and can represent a young and feasible image of the city. Also, many of the chosen places have cheap or even free offers. The combination of the characterized title (e.g. "Cheap Chinese", "Meeting Point", "Free Live Music?") and the selection of local and cheap places, again the connection to young people can be made. Traveling on low budget makes young tourists receptive for those activities.

On the backside of the USE-IT map, the city center with its nearby neighborhoods, as well as a public transportation overview and self-guided walks are mapped. Hereby, the focus of this map lies on the surrounding places and landmarks, again local suggestions and the self-guided walks draw the attention towards the unknown space. However, the number of suggestions is less than on the city center map, but is compensate through three walks. A North-walk, European- and South-walk combine many landmarks located in the areas outside the historical center. This attracts tourists to three different quarters and present three opposite images of the contrasting city picture of Brussels. All walks contain the "total walking time" and five-seven different objects (landmarks or squares) with a description to pass by. Those marked items vary in their style and category – castle, train station, squares or parks – and help the tourist to orientate and guide.



Picture 3:4 Back page Brussels (source: USE-IT map Brussels 2012)

The picture 3.4 shows the second page and the three self-guided walks can be easily recognized through the colored visualization. Also the red boxes symbolize the local tips for

the surroundings and follow the same principle as on the first map: a picture of the inhabitant, age, profession and a personal story related to the suggested place.
Additional to the tours and city map, information about alternative and public transport as well as to other travel destinations is given on the left side. This short summary of Brussels/Belgium transportation system allows the tourist to visit also other places and possibly enlarge the perception of space to multiple levels: from an isolated city space to the broader context of city networks.

The table in the Annex C, sorts the numbered suggestions of the USE-IT map Brussels into the five categories of Lynch (1960). Thereby, only the highlighted numbers with the respective descriptions were considered into the counting, as well as marked spots on the map. Some numbered places are mentioned multiple times, when one number is describing more than one component: e.g. number 4 "melting pot" mentions the café Walvis, as well as the neighboring area. Therefore, this suggestion was categorized as "landmark" and "district". Also, all freestanding objects were listed and classified as a "landmark" (e.g. local cafes, restaurants, or other buildings and institutions), as well as iconic objects, like the Atomium. This simplification will help to understand the perception of space within the categorization of Lynch (1960) during the empirical analysis. However, for the analysis, the subcategory of "tourist classic" of the landmarks will be marked separately.

The next analysis follows the categorization of city components in a visual way. Thereby, those city elements (see Lynch 1960) will be applied on the visual image of the map.

Landmarks: Similar to other tourist maps, some landmarks are highlighted with 2D signs. This concerns mainly churches or castles (e.g. St. Katelijne, Cathedral, Koninklijk Paleis) or political buildings (e.g. Federal Parliament, Palais de justice, Beurs). Through numbers marked on the map, every highlight or suggestions seems to be a landmark. Hereby, squares, areas, cafes or flea markets appear important and gain the notion of a landmark.

Picture 3:5 Landmarks Brussels (source: USE-IT map Brussels 2012)

Paths: On the first map, streets are categorized in their significance through different sizes. Thereby, thicker streets are more important traffic axes, whereas pedestrian zones are marked through grey color. Further, the self-guided walks on the second page point out different streets as well.

Picture 3:6 Paths Brussels (source: USE-IT map Brussels 2012)

Nodes: On both maps, nodes are either symbolized with a number and connected description or marked as a park or square with name. Green areas or parks within the city center are colored in green, whereas squares are not especially visualized.

Picture 3:7 Nodes Brussels (source: USE-IT map Brussels 2012)

Edges: In former times, a wall limited the area of Brussels (Fricke &Wolff 2002), which nowadays is only visible through the big streets surrounding the historical center. The river (Senne), the railroad (presented through black-white-line in the map and the metro line around the historical center can be seen as edges.

Picture 3:8 Edges Brussels (source: USE-IT map Brussels 2012)

Districts: On both city plans of the USE-IT map, only the historical center is highlighted with another color than the remaining areas. Municipalities or different areas are not mentioned on the map, but in some descriptions to landmarks.

Picture 3:9 Districts Brussels (source: USE-IT map Brussels 2012)

Conclusion – USE-IT map Brussels

This analysis showed the appearance of the different city components. For the later empirical study those city elements will be referred to and the relation between representation and perception of mapped space will be drawn.

The USE-IT map of Brussels characterizes its city with many local and inexpensive places, and is visually dominated by the presentation of landmarks. Also on paper mainly landmarks are presented, followed by the notion of districts (see Annex C). Paths are highlighted through the self-guided walks on the second page of the map, visually with color and by connected suggestions.

According to the target group of young tourists, this map offers not only touristy icons and famous museums, but also local cafes or everyday-life suggestions.

Case Study 2: Warsaw

As a second case study, the USE-IT map of Warsaw was selected. Here, structures like the Belgium network or the permanent office in Brussels do not exist, which allows later a comparative analysis. Although the goal and aim behind a USE-IT map is bound to the charter, every city provides different information, distribution and offers. Warsaw therefore was chosen to represent another form of a USE-IT map.

City background Warsaw

Warsaw, the capital of Poland, has a rich history and has been almost completely destroyed after the WWII. Since the fall of the communist regime, modern, socialist and historical architecture characterize the city picture and create a dynamic experience (City of Warsaw 2012a). Warsaw, with its 1.7 million inhabitants, is divided into 18 administrative districts, which all differ in their area and characteristically aspects. The city center (Sròdmiecie) is located at the river Wisła and contains the historical town of Warsaw. Therefore, many museums, landmarks or other tourist attractions are situated in this part of the city and attract yearly 2.5 million foreign tourists (City of Warsaw 2012b).

USE-IT Warsaw Map

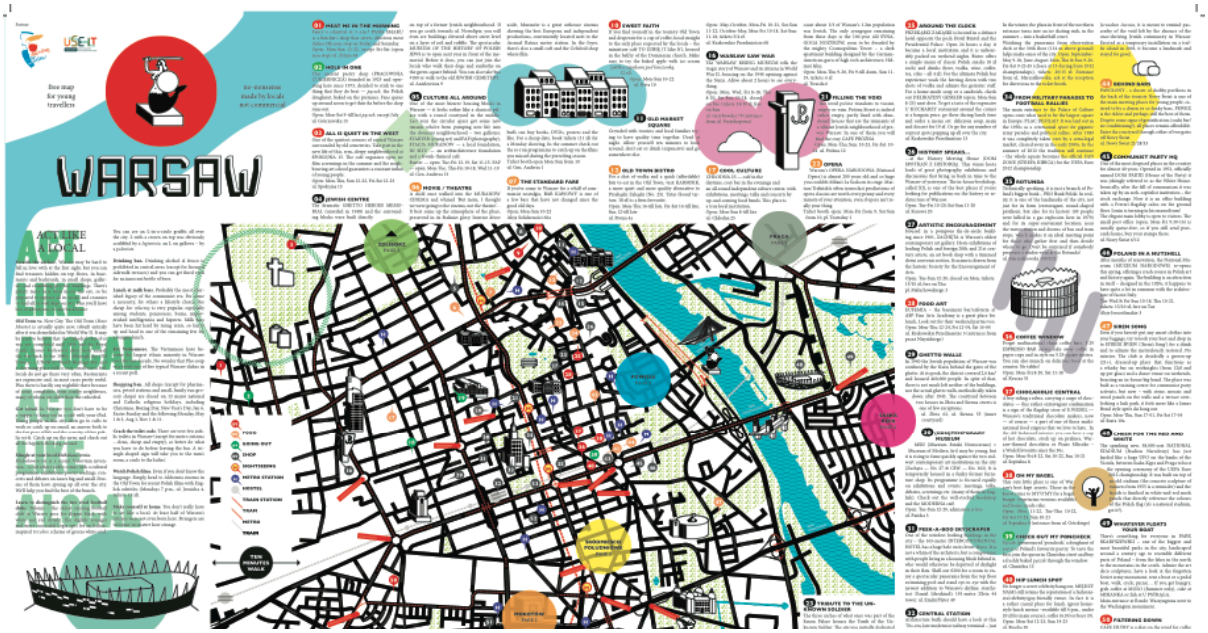
In 2008, the foundation 'bez zmiana' started the project of the USE-IT Warsaw map. This foundation, which is located in Warsaw, deals with art, design and city space and publishes every two months guides of the current art situation, exhibitions and interviews with artists. The map is financed since 2009 by the city of Warsaw and had an edition of 70'000 copies in 2012. The distribution of the USE-IT map takes place among hostels, hotel, cafes or other places mentioned on the map, but also at international events or personal requests (Interview SZ 2012).

Similar to the Brussels map, the USE-IT map of Warsaw developed its design and map structure over the years. In 2008, the focus of the map was the city center, the river Wisła and its neighboring districts. The city was, comparable to the USE-IT Brussels map of 2008, separated into a northern and southern part, with the descriptions to each landmark on the respective page. Afterwards, a city overview on one page and a more detailed map of

the city center on the other page were characterizing the USE-IT Warsaw map. In 2011, in depth plans of six neighborhoods were mapped instead of the city center. With this change, details and information in those districts can be demonstrated and allow a better orientation within those areas. Until today, this structure has been maintained and presents therefore Warsaw in seven parts: one overview of the city and six detailed maps of different neighborhoods.

The cartographic elements of the Warsaw map, as the appearance of landmarks, short descriptions linked to numbers indicated in the map, the legend and its categories, the pedometer as well as the section about 'act like a local' are similar in their function and representation to the USE-IT map of Brussels and will not be specified. However, the design and many features are unique on that map and will be analyzed into detail.

On the first page, a map of the city, descriptions to the mentioned landmarks and numbers as well as information about social culture in the section of 'act like a local' can be found. Additionally the map offers suggestions connected to the "four seasons of Warsaw": a presentation of local culture and behavior, which is typical for the different season. The map itself functions similar to the Brussels map and provides 3D landmarks and numbers, which are linked to a short description. Moreover, the public transport and the location and name of different neighborhoods through colored circles are designated within the map.



Picture 3:10 Front page Warsaw (source: USE-IT map Warsaw 2012)

In between the different descriptive sections, colored visualizations show the most popular landmarks of the city (e.g. Stadium, Palace of Culture & Science). Those figures attract the

attention through their size and animation, as well as the colored background and thereby represent the city with their pure illustration.

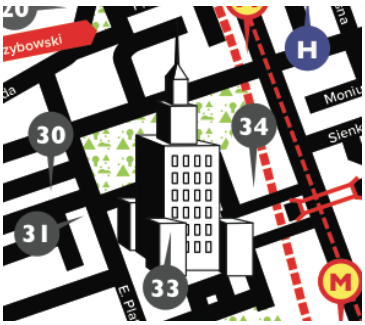
The second page contains mainly the description and maps of the six different neighborhoods, as well as practical information about hostels, transport, money, tourist info centers, galleries, museums and events. Thereby, those information respond not only a young audience on a low budget travels, but other tourists (see interview SZ 2012). The structure of the portrayal of the neighborhoods is similar to the first map of the city center; again a map, a small description of the neighborhood character and a variety of local suggestions represent each of the six districts. As mentioned, colored circles indicated the location of the neighborhoods on the first page and facilitate thereby the orientation on both maps. This leads to a better connection between the separated maps and allows a better overview.

Picture 3:11 Back page Warsaw (source: USE-IT map Warsaw)

Different to the map of Brussels, where local tips were mingled, here a separate section offers personified suggestions. Hence, young tourists were asked about their favorite places and are displayed with name and picture next to their text. Young tourists can therefore identify themselves with those persons and accept already experienced suggestions.

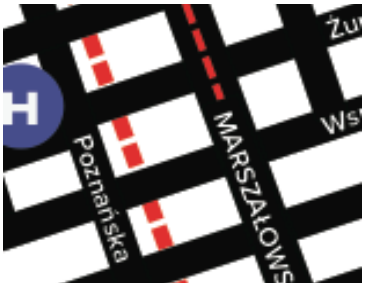
To understand the empirical analysis in chapter 5, the five city components after Kevin Lynch (1960) will be applied on this USE-IT Warsaw map as well.

Landmarks: On both pages of the map, landmarks are marked with 3D signs. Thereby, not every 3D sign is indicated with a name or even number and matching description, but is standing for itself. Therefore, without spatial or historical knowledge, those landmarks can only be experienced by accident. The few named landmarks represent cultural and administrative buildings (Palace of Culture & Science, stadium, museums). In addition, most landmarks are repeated in their design and appearance throughout the descriptive part and draw thereby interest.



Picture 3:12 Landmarks Warsaw (source: USE-IT map Warsaw 2012)

Paths: Streets as paths are colored black in this map and catch attention through its unusual usage. Importance through size is not indicated, but through naming, only big streets are labeled. Also available on that map is the network of public transportation, which is drawn into the map.



Picture 3:13 Paths Warsaw (source: USE-IT map Warsaw 2012)

Nodes: Parks are highlighted through a green coloring but are not named. Other squares or important street crossing are mentioned with red arrows, mainly in the detailed neighborhood maps.

Picture 3:14 Nodes Warsaw (source: USE-IT map Warsaw 2012)

Edges: The river 'Vistula' (pol. Wisła) indicates an edge within this city. Through the strong visualization of the streets, railroads do not seem to separate the city visually and decline in their importance.

Picture 3:15 Edges Warsaw (source: USE-IT map Warsaw 2012)

Districts: Six different districts are mentioned on the main map through colored circles, and refer to a detailed map on the second page. Thereby a short characterization of the district follows and allows an in depth study through a zoom into the particular districts. Area limits or other districts are not marked on the map but mentioned in few descriptions. Interesting also is the little attention towards the historical town, which is only mentioned with a few landmarks and numbers, but not with a detailed map.

Picture 3:16 Districts Warsaw (source: USE-IT map Warsaw 2012)

Conclusion USE-IT map Warsaw

The USE-IT map of Warsaw demonstrates various parallels to the map of Brussels regarding structure and concept. Still, the design, division of maps, target group or the presentation of local suggestions differs and represents a unique city image. With the background of the foundation, influence on the art sector is visible (information about galleries), also are local suggestions presented by (foreign) tourists. This creates a broader picture of the city and also directs the attention to the different neighborhoods or the wider overview of the city. Visually, Warsaw is represented through landmarks and streets, as they are highlighted through the black color.

3.3. Empirical Research

The research question of this thesis 'How is the spatial experience of a city map reflected in the perceived images of this space?' will be analyzed through an empirical study in two case studies. This qualitative research is asking for individual and complex results, and will orientate its analysis on the symbolic interpretation (Reuber & Pfaffenbach 2005). Therefore, the empirical research is composed of two elements: questionnaires and interviews. Both empirical tools are realized in two case studies, Brussels and Warsaw. Hereby, the selection of the case studies, as mentioned in chapter 3.2 was based on the availability of the USE-IT map and its development.
During the empirical research, young travelers were asked to fill out the questionnaire in order to receive an overview of the perception of their city image. As last part of this method, a mental map was asked to be drawn and will be the key of the analysis in chapter 4. The semi-structured interviews served as basis and overview of the particular maps and were held with members of the USE-IT organization as well as those of the official tourist information. Those will give a good overview in the work of the tourism section, but also present information for a later comparison between the USE-IT map and the official tourist map. The following chapters will present and illustrate the questionnaire and the interviews.

Questionnaire

The focus of the questionnaire was to evaluate the perception of the city image through the used map. In each city, young travelers in an age group between 18 and 30 years old were asked to fill out a questionnaire, which was structured in three parts. The first two parts were characterized by closed questions, while the third section was designed more qualitative and open, when the tourists were asked about their perception of the city.
The sample, as it is a qualitative research, was designed small and allows therefore a more detailed and personal picture of the individual idea of the city image.

Next, the different parts of the questionnaire will be presented into detail and their aims explained. The questionnaire is structured in 3 parts, starting with the introduction and

basic information about gender, age, reason to stay, location of stay, and tools for the orientation in the city:

1.	*I am*		female		male		
Age:							
2.	*I am staying in (name of the hostel/hotel/other):*						
3.	*I am here already since:*						
1	2	3	4	5	6 nights	>1 week	> 2 weeks
4.	*I will stay in CITY in total:*						
1	2	3	4	5	6 nights	>1 week	> 2 weeks
5.	*I have been in CITY:*						
Once (this time)			two times		more often		

Table 3:4 First part - Questionnaire (source: own table)

With those questions, the purpose and general information about the visit in Brussels or Warsaw shall be examined. Thereby initial knowledge about the city space and orientation within the city structure can be determined. With increasing frequency of visits within a certain urban space, this area can lead to a level of familiarity. Therefore, the city image develops different and more advanced with a more complex understanding of the city (Lynch 1960; Pearce 1977).

In the second part, the questions are addressing the USE-IT map itself. Now, the usage of the map, as well as its suggestions and hints are questioned.

6.	*To visit the city, I use*:			
USE-IT map	other tourist map	guidebook	Smartphone	
other:				
7.	*Because of the USE-It Network, I will stay longer in CITY, or visit other USE-IT cities:*			
Yes	No	Maybe		

Table 3:5 Second part - Questionnaire (source: own table)

The type of map, which is used to explore the city, can help to examine and identify the differences between the perceptions of space through maps. Further, the next question deals with the possibility of integration of space within a network. If tourists would be encouraged to travel within the existing USE-IT network, city space could be reaching a different level, that just a limited city space. A connection and relation between cities could establish and would increase the mental image of a city to a picture of a bigger scale. Also, the subjective attractiveness of the map as well as the growing interest in city space can invite young

travelers to other cities. This could not only be an advantage for other USE-IT maps but also city marketing or strategies.

The third part of the questionnaire is approaches the question of the mental map and perception of the actual city space.

8.	*My 5 favorite places in CITY are: (and please rate them whether they feel touristy or not)*						
1.		very touristy	1	2	3	4	5 very local
2.		very touristy	1	2	3	4	5 very local
3.		very touristy	1	2	3	4	5 very local
4.		very touristy	1	2	3	4	5 very local
5.		very touristy	1	2	3	4	5 very local
9.	*And finally, could you draw a sketch of a map of CITY (including your 5 favorite places)?* (Please use the backside of this paper!)						

Table 3:6 Thrid part - Questionnaire (source: own table)

The first questions of the third part deal with the most memorable places in the city, when the visitor has to specify his/her favorite places and name them. With a certain map, different suggestions about the highlights and landmarks of the city can be presented, but is the visitor following those proposals? What influence does the USE-IT/other tourist map have on the movement in space and does it open new possibilities and travel destinations to the individual? Is a city considered as an individual, isolated space, or is it seen in a bigger context or network to other cities? Questions as mentioned can help to understand the perception from a visitors view (Lynch 1960; Pearce 1977), as also the rating of 'touristy' and 'local' places is made. Here, the visitor has to evaluate the places within the city about their level of tourism and give an understanding of the different representative character of the city. At the local level, a city can demonstrate a more daily life atmosphere, whereas at very touristy places only mainstream and a fairytale city are represented. The last question of this survey is following the question about a mental map. Hereby, the perception and representation of the city space shall be studied. With this mental map, the individual can draw their own map of the city and are asked to locate the most important elements. On the questionnaire no helping landmarks or city boundaries were simplifying the process of the mental map, in order to allow the respondent to imagine himself. That is, as this thesis is not trying to study distortion of cognitive maps, but more the remembered objects, landmarks and the image itself.

Do the different mental maps correlate with the actual USE-IT map? How are e.g. landmarks perceived? Is a holistic city image possible? Does the city image develop more

advanced depending on the duration of the stay? How does the location of the hostel/hotel influence the map? Here, the results will be analyzed regarding the theory of Kevin Lynch mentioned in chapter 2.4.

As the sample group was limited to young tourists, at youth hostels and, if existing, at USE-IT offices the questionnaires were distributed and the author was present to answer possible questions or additionally information regarding the questionnaire. Although, the USE-IT map Brussels is distributed to all youth hostels in this city, not all travelers used this map. Therefore, it was possible to gain a more heterogenic sample, as users of other tourist maps were filling out the questionnaire and were able to allow a comparison between the different types of maps in chapter 5.
Also in Warsaw, various youth hostels were location of the survey. Not all youth hostels in Warsaw were providing the USE-IT map, which is because of the shortage of the edition through the UEFA EURO 12[5]. This event led to an unequal distribution amongst hostels. The 'Tamka Hostel' in Warsaw did not provide the USE-IT map, whereas the 'New World Hostel' and the 'Nathan's Villa Hostel' could hand out this map to their costumers. Through this variety of survey location, a mixture within the sample was achieved.

After the finishing this survey, the data were collected and interpreted with the program "Microsoft excel". Hereby, quantitative results and correlation will assist the empirical analysis in chapter 5.

[5] The UEFA EURO 12, the UEFA 2012 European Football Championship took place in Poland and Ukraine in June/July 2012. This led to an increase of tourists in e.g. the city of Warsaw. For more information see: http://www.uefa.com/uefaeuro/index.html

Interviews

In both case studies, interviews among members of the USE-IT map management for the USE-IT, but also official tourist offices were conducted. With four semi-structured face-to-face interviews and one semi-structured group interview, the aim, history, specialty, and general questions of the specific map have been discussed.
Semi-structured interviews allow a free conversation with spontaneous inquiries, but are orientated on guiding key questions (Mabry 2008; Reuber&Pfaffenbach 2005). With the focus on the research question, the interviews were led with questions in order to structure the conversation. This form of interview allows to gain data and knowledge about the research (Bryman 1989) and to achieve a comprehensive and comparable picture of the city and map. According to those leading questions, the interview was structured into four different parts: general information about the map, personal view of the city, image within the map and improvement of the map.

The role of those interviews can be seen as an important source for background information on the maps as well as data for a later comparison of the mental maps. Through the conducted interviews, not only the map itself could be focus of the discussion, but also the city, its image and the city image presented the questioned organization can be detected. Questions about the personal view on the city help to present the city from a local perspective and evaluation. This can be additional information to the city map and facilitate the understanding of the particular city (image).

4. Results of Survey

During the city visits in Brussels (21.6. – 26.6.2012) and Warsaw (07.07. – 10.07.2012) the questionnaires were handed out and the interviews conducted.

4.1. Results of questionnaires

In both case studies, 41 (Brussels) respective 36 (Warsaw) questionnaires were collected. In Brussels, four respondents were older than the target group of 18 to 30 years and seven subjects living in Brussels. Those questionnaires were not considered in the further research. However, two subjects did not specify their residence, two others were living inside Belgium. Those four respondents count in the survey, as daily trips to Brussels are considered as traveling. The final sample therefore counts 30 questionnaires (15/15 female/male respondents) with a mean age of 23.6 years.
36 subjects have answered the survey in Warsaw. Thereby, one respondent was living in Warsaw and two subjects were older than the allowed target group. Again, those answers were not considered any further. Hence, 33 subjects (22 female/ 11 male respondents) with a mean age of 22.8 years were participating in the survey. The average duration of the city trips in Brussels was 4.9 days, whereas in Warsaw the respondents stayed in average 3.3 days. At the time of the survey, respondents in Brussels were visiting the city for already 2.7 days, in Warsaw for 2.2 days. The inclusion of answer "staying more than 2 weeks" was causing those high average numbers. 82% of the subjects were for the first time in Warsaw, 73% in Brussels. Therefore, 18% were visiting the city of Warsaw for the second time or more often, 26% in Brussels. Those numbers will be of importance when analyzing the mental maps, as 18%, respective 26% of the respondents are already familiar with the city and might have a different or advanced perception.

Three different locations in each city were selected to achieve a broader sample group and a variety of map users. In Brussels, the USE-IT office, '2GO4" hostel and 'Generation Youth hostel', in Warsaw 'Nathan's Villa Hostel', 'Tamka Hostel' and 'New-World Hostel' represent the three locations. The survey and its results however do not characterize a quantitative and representative study, but concentrate on qualitative research with its mental maps and the perception of space on a qualitative scope.

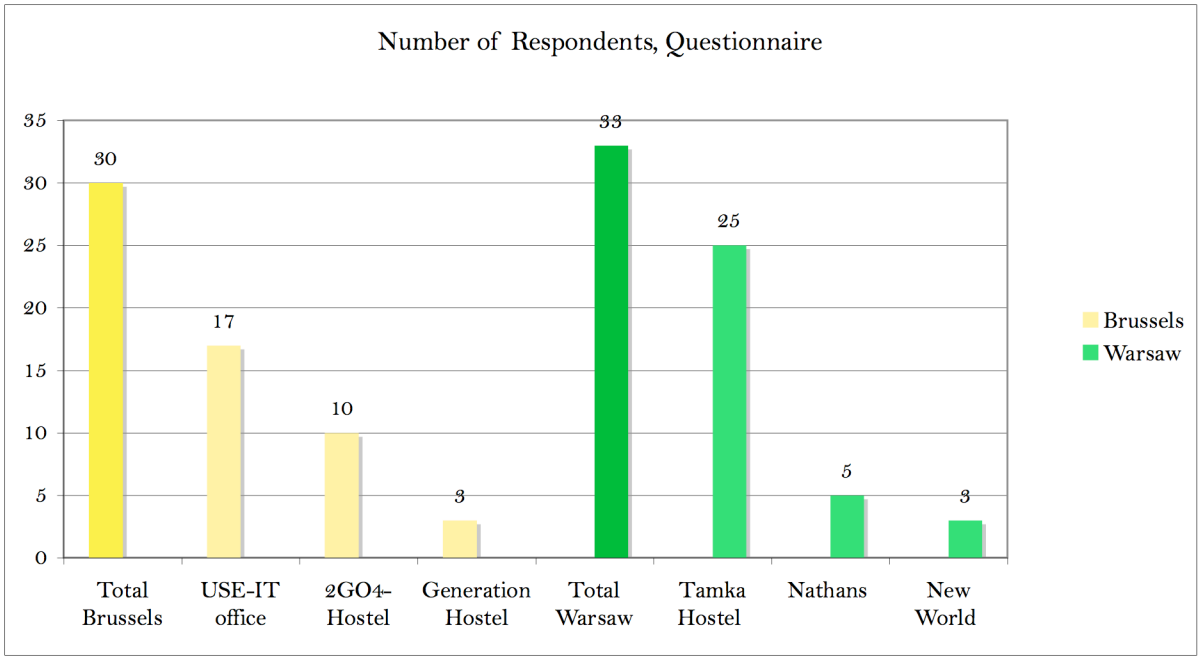


Figure 4:1 Number of Respondents in Questionnaire (source: own survey)

The figure 4:1 lists the number of respondents according to the location of examination. At the USE-IT office in Brussels and at the Tamka Hostel in Warsaw most of the subjects were questioned. This may explain the high number of invalid questionnaires among the Brussels survey, as many locals were visiting this place.

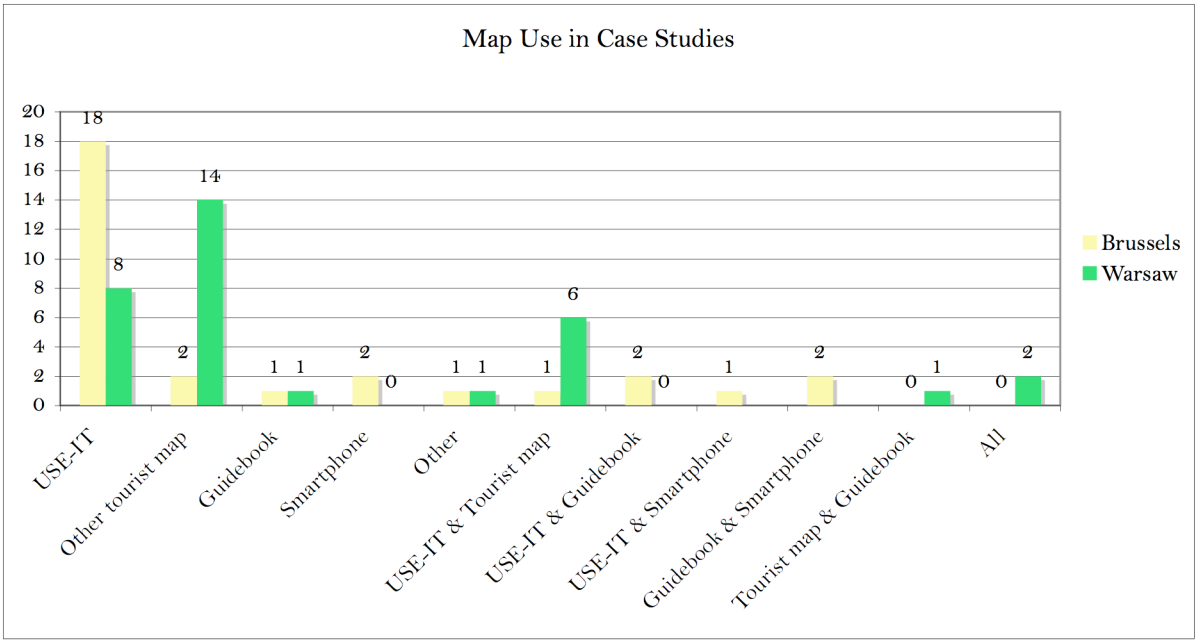


Figure 4:2 Map Use in Case Studies (source: own survey)

In Brussels, 18 subjects of the survey used only the USE-IT map, while four respondents combined it with other devices or maps. Only seven subjects were traveling with other maps, guidebooks or devices. This result may be influenced by the holistic distribution among hostels in Brussels. Only a few participants were using guidebooks or smart-phones. The share of the users of the USE-IT map in Warsaw is only by 14 travelers, whereby six of them are combining it with another tourist map. 14 subjects are using other tourist maps, whereas the explicit guidance through a smart phone is not applied. Three respondents are navigating by means of a guidebook, other devices/maps or the combination of tourist maps and guidebook.

4.2. Results of Interviews

Interviews in both cities were conducted to achieve a better overview and detailed picture of the particular maps. Therefore, the managements of the USE-IT maps in both cities, as well as the official tourist organizations were answering semi-structured questions during a face-to-face interview.
The following persons were interviewed:

Interview	Name	Position
N.01: USE-IT Brussels	Nicolas Marchial (NM)	Chief Editor
N.02: VisitBrussels	Bernadette Berlage (BB) Valérie Defauw (VD) Sophie Goeminne (SG)	BB: Manager Publications VD: Supervision Offices de Tourisme SG: Deputy General Manager
N.03: Warsawtour	Beata Zwadziszewska (BZ)	Publication Specialist
N.04: USE-IT Warsaw	Szymon Zydek (SZ)	Coordinator of distribution
N.05: USE-IT Warsaw	Grzegorz Piątek (GP)	Text Editor

Table 4:1 Interview partner

All interviews were recorded with the approval with the interviewees and recordings can be found in Annex D. The main points of those conversations are listed in the next table.

Interview	Personal View on the city	Target group & Aim of the map	Specialty of the map	Representation of space
No 1: NM	Architectural & cultural & social contrast, unfinished city, "mystery" parts	Young travelers, low budget guide	Guidance through the city; only unique and authentic places (also tourist places);	Self-guided walks represent authentic and contrasting city image;
No 2: BB, VD, SG	Lifestyle, walk able city, welcoming society, City of contrast (architecture history, society)	Map for everybody (focus on two districts: European, Louise), provision of basics	Official map, provision of great information, main places to visit. Also: different specific themed maps	Historical center, European quarter (as image of Brussels) and Louise (= art nouveau) Contrasts also through themed maps
No 3: BZ	Modern, open, full of culture, safe, beautiful, good stereotypes;	A general map for all tourists	Different maps with specialty, routes, no advertisement, for free,	Through museums or other landmarks
No 4 SZ	Three cities in one, three different districts	Maps for young people, but also open to all tourists/interested people	Combination of local and touristy places, galleries	Presentation of "not obvious spaces", less focus on 'mainstream' or tourist places
No 5: GP	Unfinished city, umbrella for many elements, open, dynamic	Show accessible culture for young tourists		Dominance of consuming places (culture is language bound)

Table 4:2 Main Points Interviews

During the interviews, the map but also the view on the particular city were center of the conversation and allowed the author to have an insight in the processes of the city mapping, marketing, and map offer.

5. Analysis

With the results of the questionnaire and the interviews, the question about representation of mapped space and its perception through tourists shall be answered with the following analysis. In chapter 5.3 the results of the case studies will be compared and shall give a conclusive picture of this thesis.

5.1. Case Study I: Brussels

To analyze the perception of the city space of Brussels the results of the question 8 and 9 will be presented. Thereby, the theory of Lynch (1960) will be applied to classify the favorite places into comparable categories. Those categories as well as the mental maps are later set into correlation with duration of time or location of residency to study the different city images.

5 favorite places Brussels

59 different places were named in Brussels, whereas the frequent answers ('top 16') are presented in table 5:1. Amongst the USE-IT users 52 different places were mentioned.

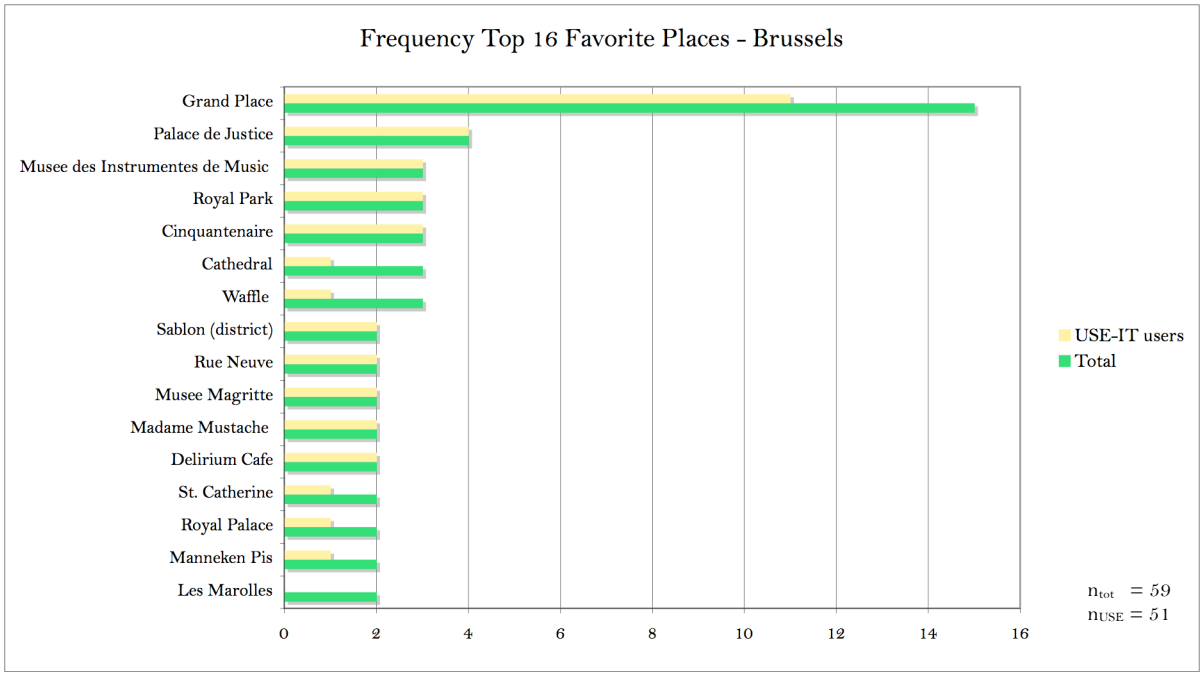


Figure 5:1 Frequency Top 16 Favorite Places - Brussels (source: own survey)

Exactly 50% of the participants were mentioning the 'Grand Place' as one of their favorite places in Brussels. The 'Palace de Justice' was named 4 times, followed by the 'Musee des Instrumentes de Music', 'Royal Park', 'Cinquantiere', 'Cathedral' and 'Waffle' with three mentions. All other places were named twice during the survey; a list of the single mentions can be found in the Annex A. Remarkable thereby is the proximity of all mentioned places. All top 16 favorite places are located in the city center, only a few places are found outside of the old city walls (Fricke &Wolff 2002).

The rating of the 'favorite places' can be give insights on the perception of the particular places and are presented in table 5:2, whereby the most frequent places are mentioned.

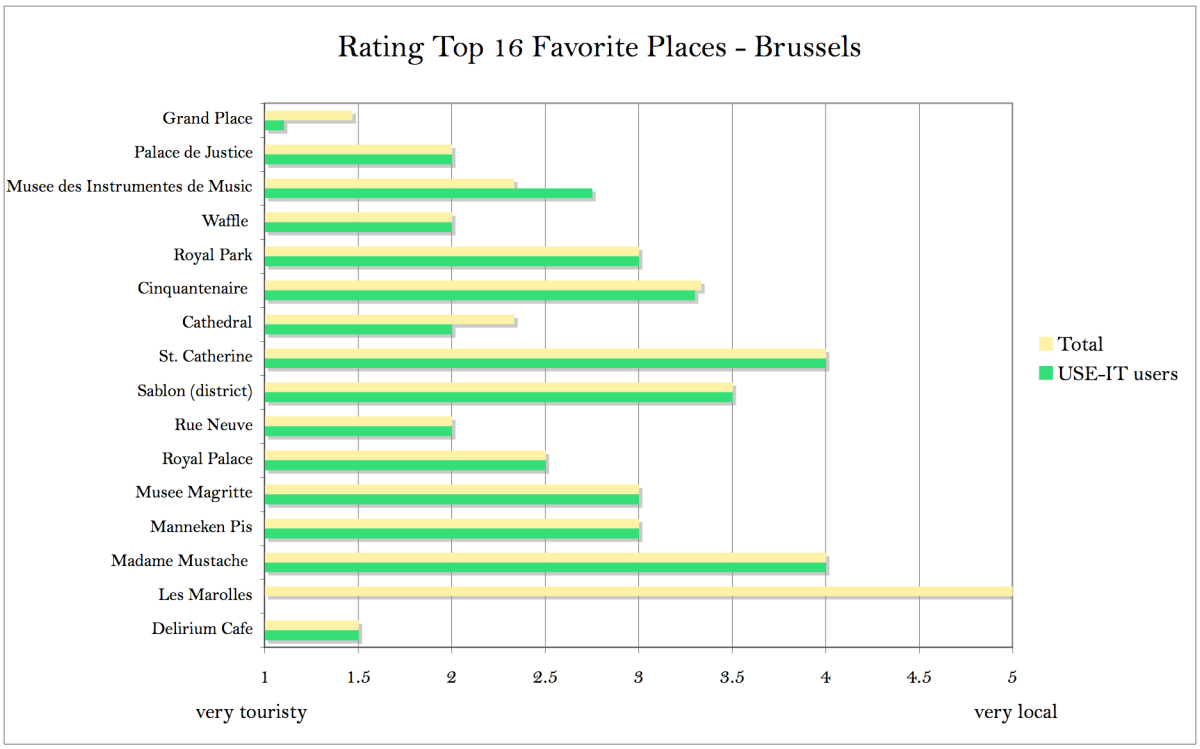


Figure 5:2 Rating Top 16 Favorite Places - Brussels (source: own survey)

Among all respondents, the 'Grand Place' was perceived as "very touristy", whereas the district 'Les Marolles" characterized as "very local'. Also, the 'Grand Place' was the only place, which was rated as "very touristy", while other places were rated less touristy from 1.5 upwards (1= very touristy, 5 = very local). Districts, such as 'Les Marolles' or 'Sablon' were on average more local perceived as representative buildings ('Cathedral', 'Palace de Justice'). Cafes or restaurants are characterized differently: 'Madame Mustache' was rated as

4 (local), whereas 'Delirium Café' was seen as touristy. The audience of the particular institution might cause those ratings.

Also, the rating depends on the presence and appearance on the tourist maps. 40 of the total 59 favorite places are mentioned on the USE-IT map, 34 on the official tourist map. General expressions (groceries, shopping area, all cafes, waffles, chocolate) or places outside of the map (African Museum) do not emerge on the maps. The USE-IT map displays all of the 16 favorite places, except a specification on the general term "waffles".

Categorization

The application of the theory of Lynch (1960) allows a good overview of the mentioned places and facilitates the interpretation of the city image. In this analysis, the main tourist attraction of the city, the Grand Place, was categorized as landmark. According to Lynch (1960) this square should be classified as a node, as landmarks are characterized by "uniqueness", "specialization" and "singularity" (78). Still, the Grand Place is a square but often read and understood as one representative object. Even in the tourist maps, the town hall tower is associated with the naming of Grand Place.

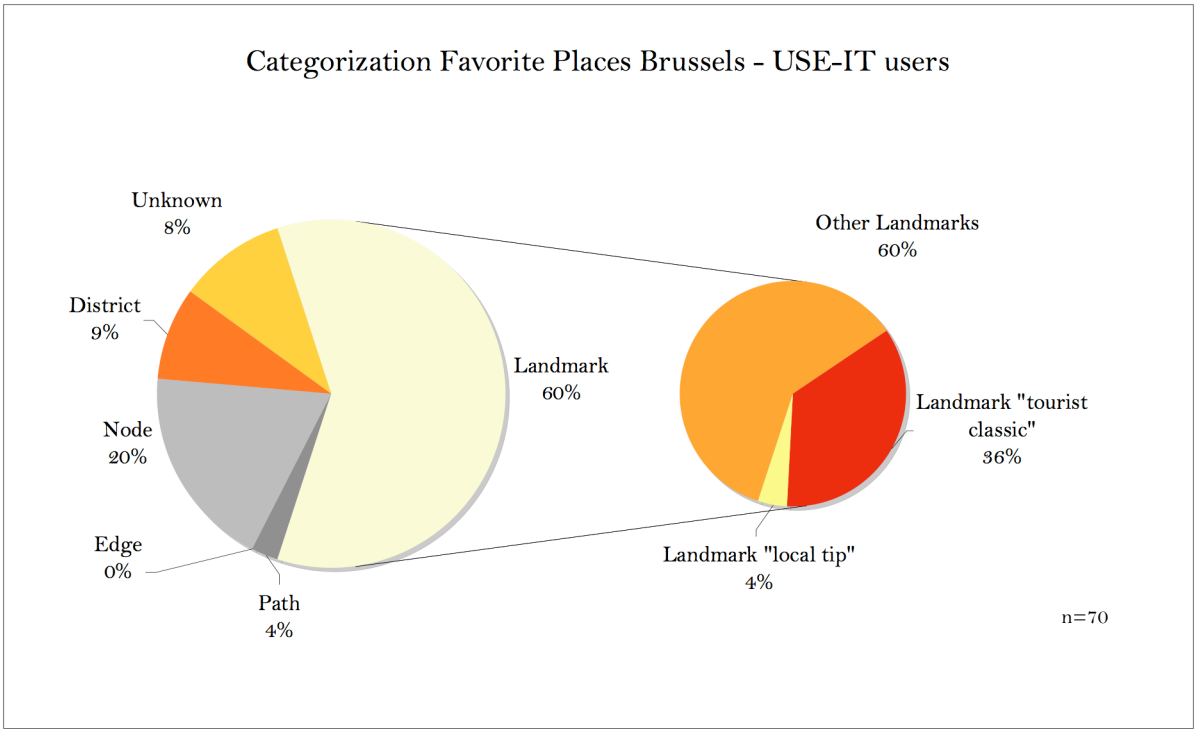


Figure 5:3 Categorization Favorite Places Brussels - USE-IT users (source: own survey)

Further, general expressions (e.g. groceries, chocolate, waffle) were isolated and classified as "unknown". 60% of the 70 mentioned favorite places of USE-IT users were classified as

landmarks, 20% as nodes and 9% as districts. Only 5% / 0% of the places were categorized as paths respective edges.

The representation of the places is clearly 'landmark-dominated' and reflects hereby the interests and orientation points of the young travelers. Nodes (e.g. Royal Park, Cinquantaire) but also areas or districts, like 'Les Marolles' or 'Sablon' appeared in the list and create a more diversified perception of space. Paths were mainly referred to shopping or commercial streets (Rue neuve, Rue de bouchers). According the division of 'tourist classics' and 'local tips' of landmarks on the USE-IT map, the places classified as landmarks were split up into those categories: thereby, 16% are 'tourist classics' (e.g. 'Grand Place'), whereas only 8% of the mentioned landmarks can be seen as the 'local tip' ('Flee market Marolles'). The other 76% are landmarks not specified on the USE-IT map.

Duration of Stay

In chapter 2.5, the importance of landmarks and paths in the mental map of the subjects were discussed and two different approaches presented. Lynch (1960) and Pearce (1977) were mentioning the domination of landmarks and the more frequent appearance of paths with an increase of the visitors stay.

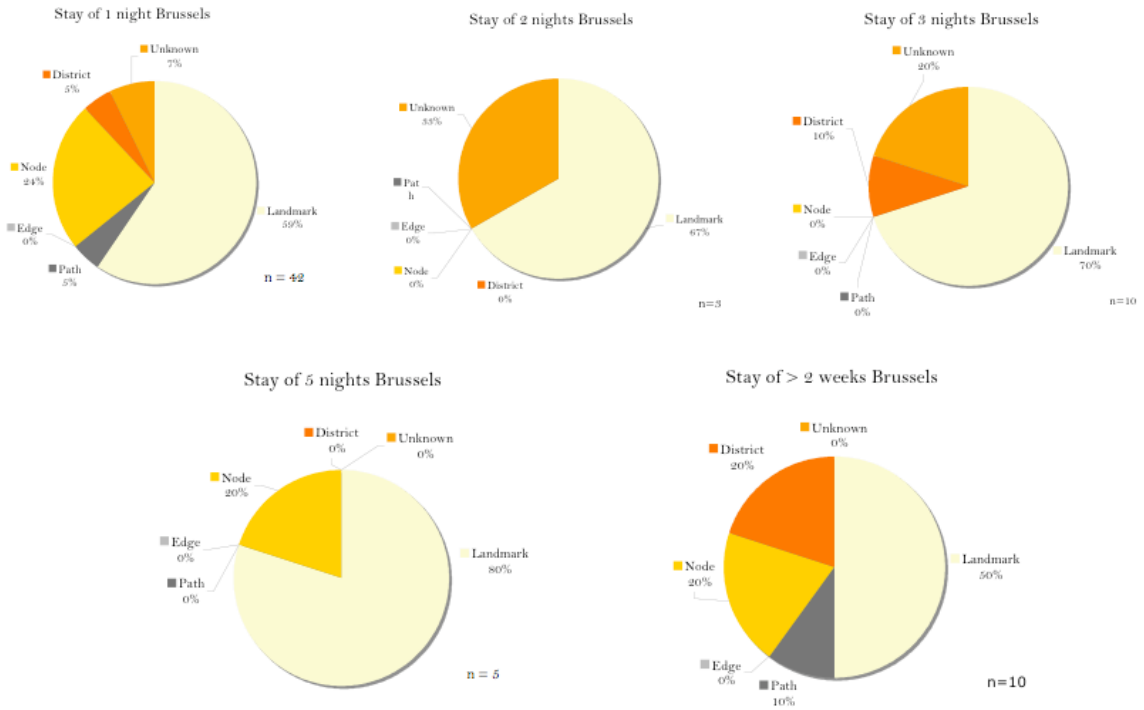


Figure 5:4 Stay and Category Brussels - USE-IT users (source: own survey)

Looking at the correlation between the actual stay of visit and the naming of the places, the importance of landmarks is outstanding. Respecting the small survey, those numbers are not representative and give only a narrow picture of few single subjects.
Also, at a stay of more than 2 weeks, the two respondents were naming 10 different places. Still, landmarks are dominating, with enlarging importance of districts and nodes. A greater frequency of paths is not significant.

Landmarks are therefore still the main favorite place and orientation point and does not modify in correlation to the duration of the actual stay.

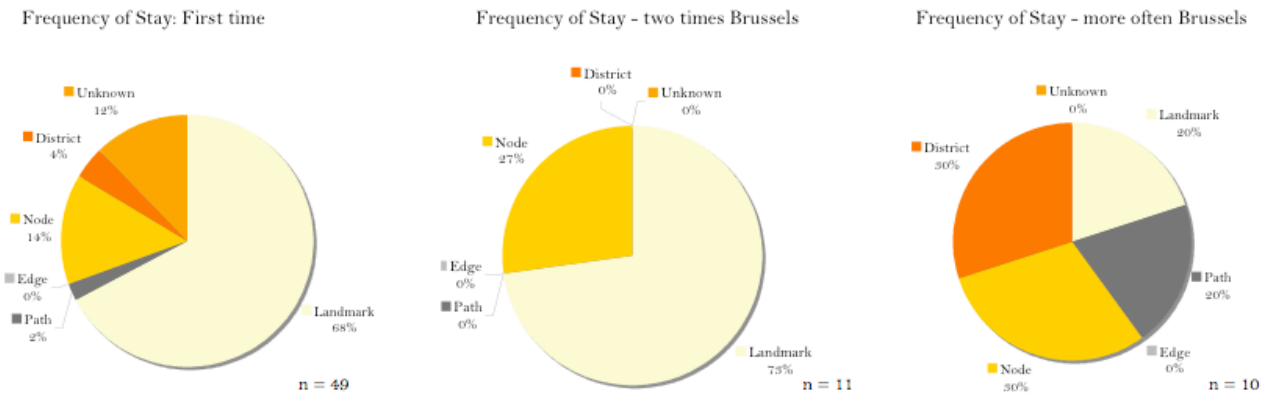


Figure 5:5 Frequency of Stay Brussels (source: own survey)

The figure 5:5 combines the frequency of the stay – question 5: "I have been in Brussels" – and the named places. Hereby, a significant decrease of the number of landmarks with a synchronic increase of the number of nodes, districts and paths. This finding agrees with the theory of Lynch (1960), that familiarity with a space adjusts the diversity in the named categories (Pearce 1977: 208).

Therefore, no correlation could be found between the mentions of the favorite places and the duration of the actual stay, yet an analysis of the frequency of the visit presented a significant connection: the more familiar the tourist is with the urban space, the more equal is the division of the five categories of Lynch (1960).

Mental maps Brussels

The following analysis presents mental maps, drawn by users of the USE-IT map and demonstrates the perception of the city space.
Likewise to the favorite places, the city components drawn on the mental maps are counted and classified. Symbols and singular objects were seen as landmarks, streets/lines as paths, and circles/squares as nodes. Edges, such as rivers, or districts were only identified when named.

152 elements were found on the 18 mental maps. 59% of them are categorized as landmarks, 25% as paths. As the number of favorite places was restricted, an increase of the total number of places on the mental maps was visible.

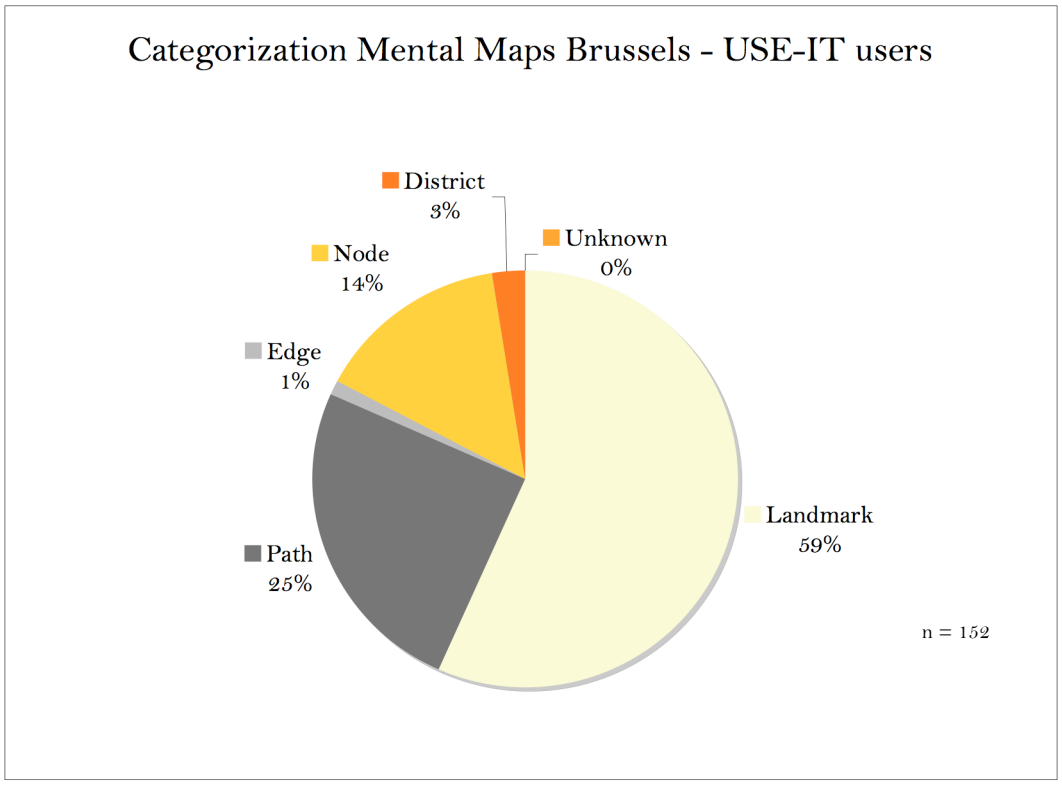


Figure 5:6 Categorization Mental Maps Brussels - USE-IT users (source: own survey)

Comparing these numbers with those of the favorite places, an increase of paths from 4% (favorite places) to 25% (mental maps) can be seen. Tourists may remember routes or directions and navigate through streets towards their goal, but also are paths used to connect different locations. The structure of the city with its isolating elements 'districts and edges' are cited little in this analysis. To grasp differences in characteristics or to feel

boundaries is difficult and requires time (SOURCE). Also, names of districts or the rivers (as edge) are not present on the maps, which lead to this result. Something about nodes?

Duration of stay

Landmarks are the consistent element of all mental maps and affirm their importance with no correlation to the duration of stay. The following figure shows the relation between the appearance of the city elements and the length of stay. The relative number of paths increases, as well as districts.

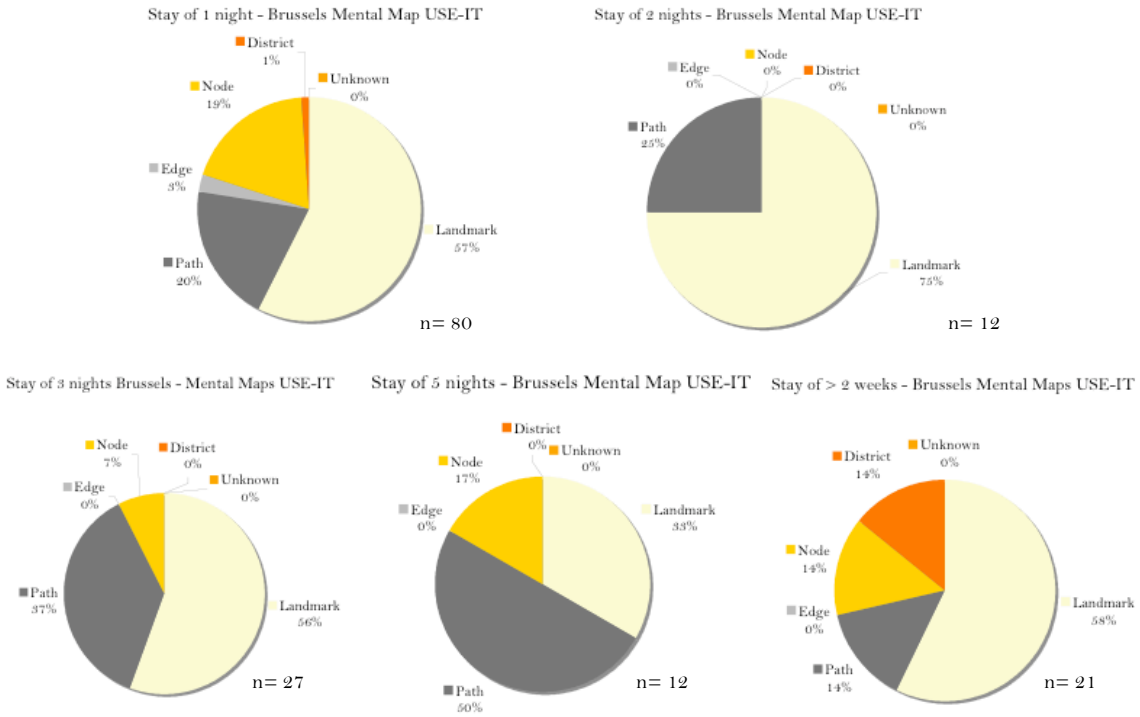
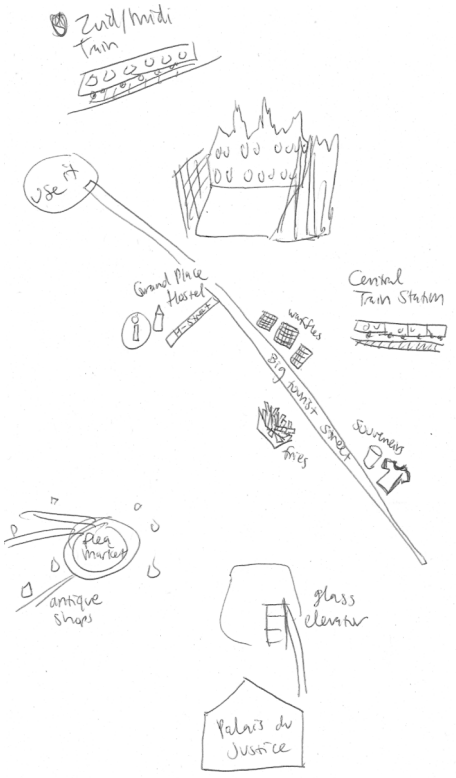


Figure 5:7 Duration of Stay Brussels Mental Maps USE-IT (source: own survey)

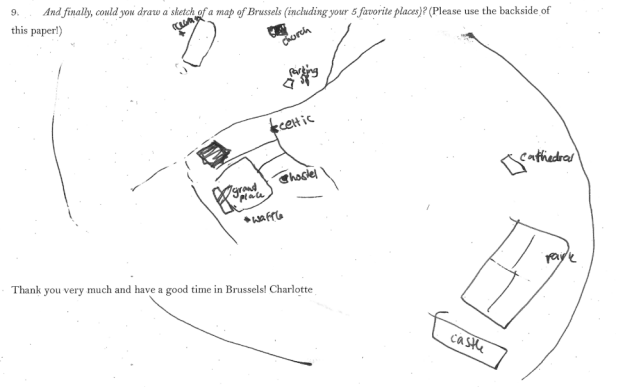
Although paths play an important role, young traveler who stayed in Brussels for 1 night, show a very fragmented picture of the city. Streets may connect locations of short distances, but landmarks are drawn without any relation to each other. Therefore, those elements are located on the map as the tourists were imaging them. Also, notations or titles for unknown streets or objects are mentioned on those mental maps. One example for this group is presented in the picture 5:1.

Picture represents the city image after one day: the orientation of the tourist is bound to unrelated landmarks. The city image is distorted in geographical terms but also names are not familiar yet. The person translates overall impressions into name streets (see: 'big tourist street', 'souvenirs') or states out certain characteristics for a district. Further, as in other mental maps, symbolic drawings, such as the train for the train station, do represent general knowledge about the different places.



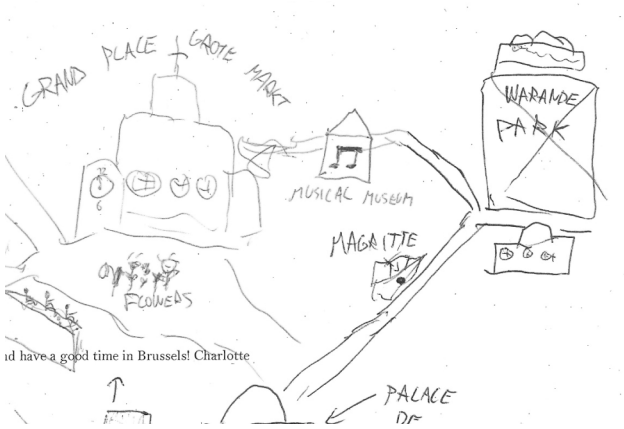
Picture 5:1 Mental Map - one night Brussels (source: own survey)

The second picture XX presents a mental map of a tourist with 3 days stay in Brussels. Hereby, the drawing is surrounded by a limitation, which indicates the area of the city center. Again, landmarks are not connected by paths, but are drawn in a realistic distance to each other. Hereby an increase in orientation can be seen between the current and previous mental map.



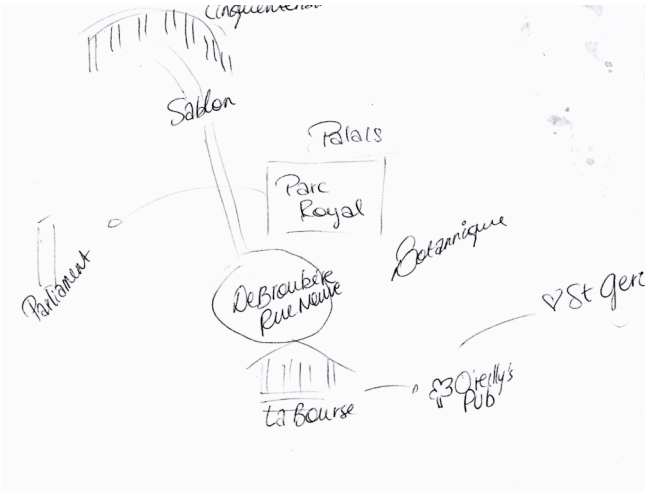
Picture 5:2 Mental Map - 3 nights Brussels (source: own survey)

With an increase of the duration of stay, a more holistic city picture of the city is perceived. Every landmark is connected through paths and symbolized by attributes. Those small signs (flowers, people) are drawn on the map and allow a detailed image of the city. Still, the scope of city is narrowed to the center, with the Grand Place as a reference point.



Picture 5:3 Mental Map - 5 nights Brussels (source: own survey)

The last picture opens up the narrow area limitation of the city center with mentioning different neighborhoods. So far, in all mental maps, the Grand Place symbolized the center of the imaginary city, whereas this map displays "de Broukere" as center. Further, little arrows navigate between the locations, whereas no paths are mentioned. Landmarks are drawn very basic, whereas previous maps contained more representative images.



Picture 5:4 Mental Map - > 2 weeks Brussels (source: own survey)

With the length of stay, landmarks represent the most important reference point, however, the city perception shifts from a scattered image of loose objects towards a connected city picture. Distortions in the accuracy of placing objects are decreasing with an increase of the stay, but are still visible in all mental maps.

Analyzing the relation between the frequency of stay and the drawn mental maps, no significant decrease of the number of landmark or increase of paths, as Lynch mentions (Pearce 1977), could be found:

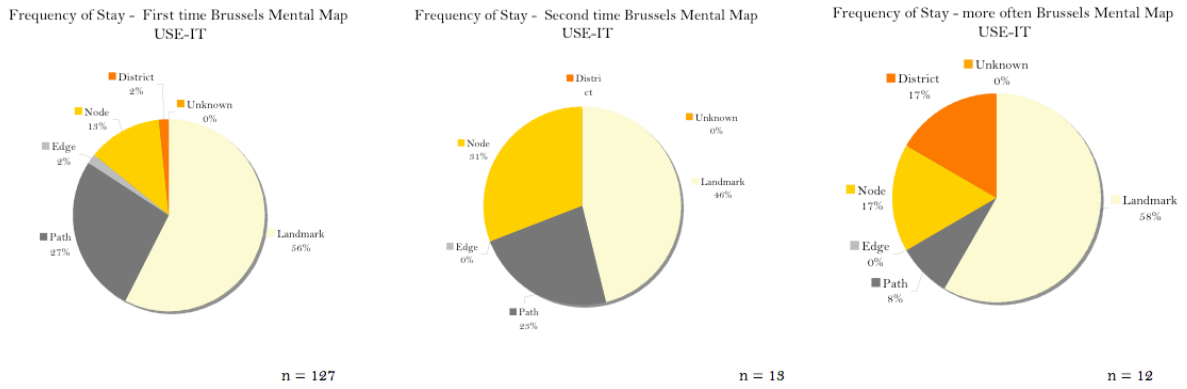


Figure 5:8 Frequency of Stay - Brussels Mental Maps (source: own study)

Still, the unequal sample size shall be in mind, when interpreting this figure. While 17 subjects were visiting the city for the first time, only four respondents were in Brussels for the second time, respective only one respondent more often. Therefore, no discussion or interpretation of those figures will follow.

Representation of space Brussels

With the naming of the '5 favorite places' the respondents were mentioning important orientation points and memorable places within the city. Places were categorized and present a landmark-dominated picture of the city. This result agrees with the Lynch (1960), whereas tourists remember and navigate mainly among landmarks. Nodes, such as parks or squares were named in 20% of the cases and play therefore also a great role in the representation of the city. With the 'Grand Place', one of the main sights was named the most, whereas the 'Atomium', another 'tourist classic' was only mentioned once. Hereby, visitors refer to the Grand Place as a landmark, as the square is read and identified as a singular object. The proximity of the places, as well as the short average duration of the visit might explain the narrow area coverage. A correlation between naming places and the length of the visit was hereby not significant.

The analysis of the mental maps allowed an insight of the perception of the city space of young travelers. Landmarks again present the majority of the mental image, while paths

were used as a connecting element between those. The little mention of districts and edges on the mental maps is associated with the lack of presence on the actual maps. Further, a correlation between the length of stay and the development of the mental maps was feasible. With an increase of the duration, a more holistic perception of city space was gained. Paths were connecting landmarks and the city became legible. Distortions were found in misjudgments of distances and locations in the cognitive maps and lead to an altered spatial knowledge.

During the analysis of the mental maps did not reveal any correlation between the location of residency and orientation. Also, a comparison to the total survey did not present a significant change in the results.

5.2. Case Study II: Warsaw

In Warsaw 36 questionnaires were collected and will be analyzed according the same procedure as with Brussels.

5 favorite places Warsaw

For Warsaw, total 55 different places were named. USE-IT users mentioned a variety of 25 places. By far, the term 'old town' was the most frequent with 24 mentions. Hereby, all similar expressions regarding the old town were collected: inner city, historical center, center or the polish expression 'stare miasto'. A list of the remaining places can be found in Annex B.

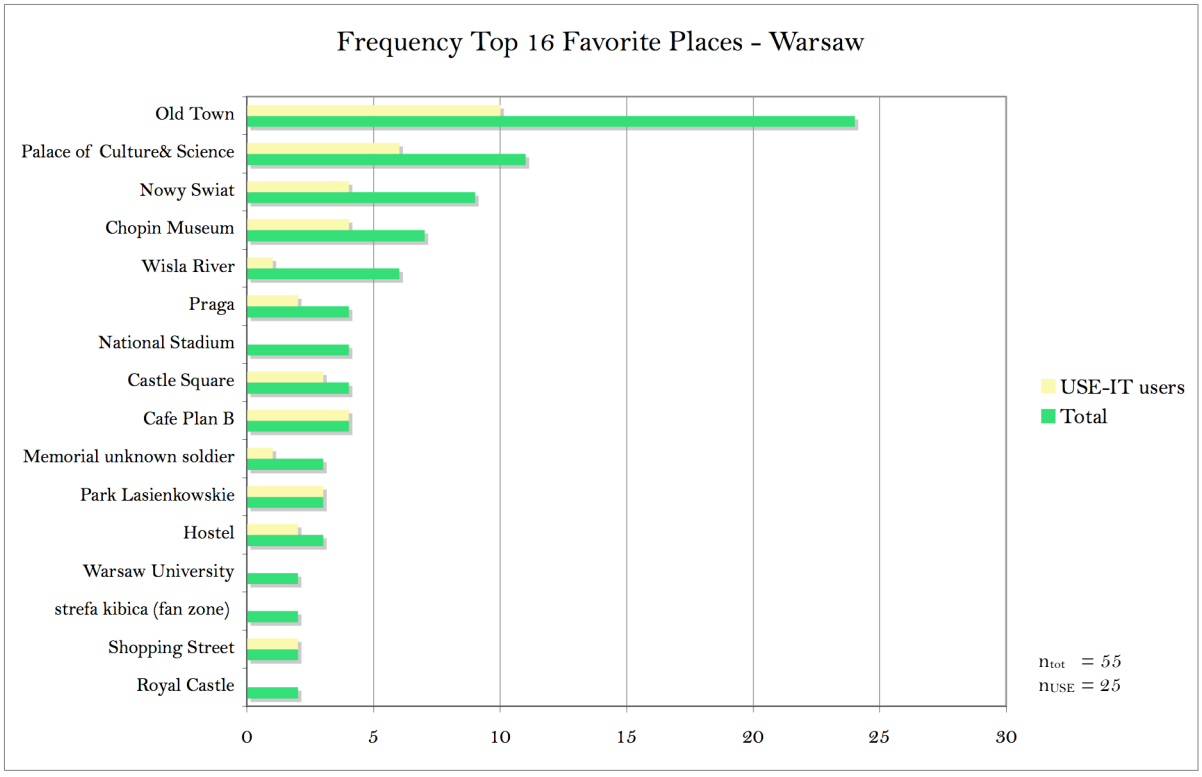


Figure 5:9 Frequency Top 16 Favorite Places - Warsaw (source: own survey)

Museums or commercial institutions, as 'Nowy Swiat' or Chopin Museum, are ranking high but surprisingly, general city elements, such as the river Wisła and the district Praga are cited by 6 respective 4 subjects. Also the national stadium and the fan zone reveal the event of the UEFA EURO in Warsaw.

All the mentioned places are dispersed within the city and allow a broader perception. With the park Lasienkowskie in the South and the old town in the North, almost a whole longitude section is presented.

In average, the subjects rated the places as 3.7 (1 very touristy, 5 very local). The 14 USE-IT users estimated an average of 2.6. Therefore, the latter group evaluated their favorite places more touristy as the total sample.

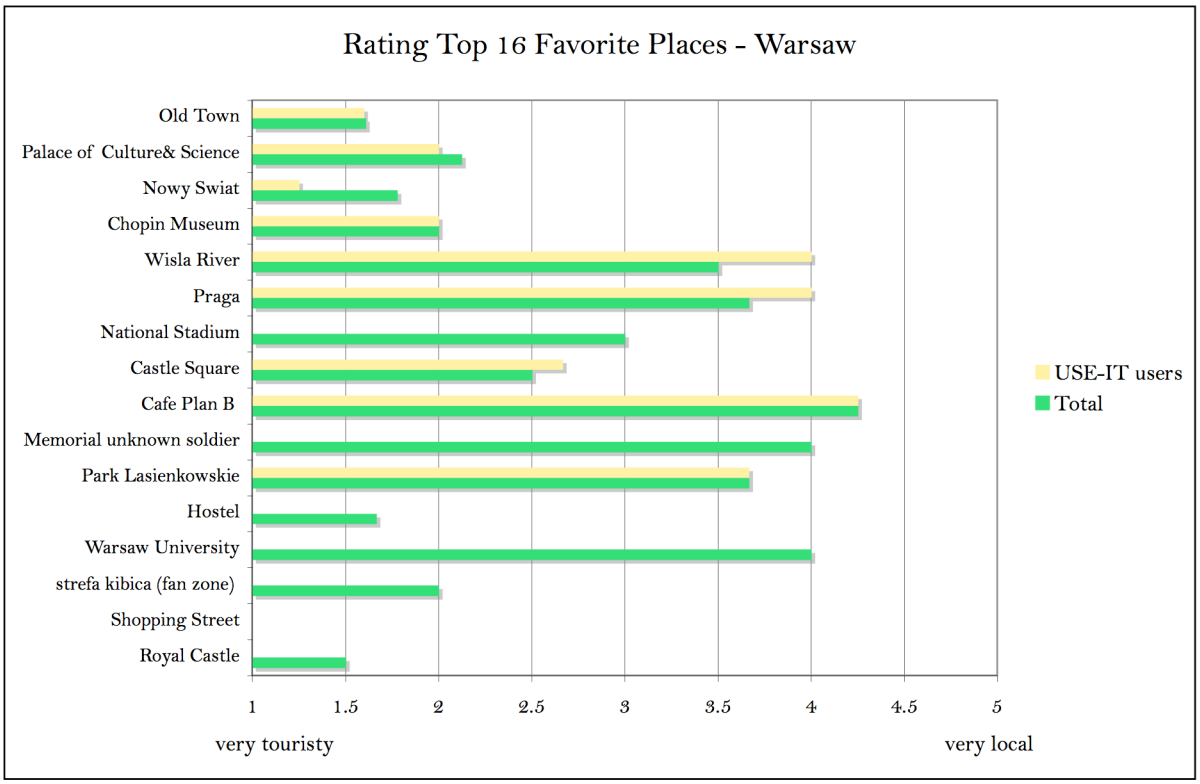


Figure 5:10 Rating Top 16 Favorite Places - Warsaw (source: own survey)

The river Wisła, Praga, café Plan B and the Warsaw University are rated as local, places, which are part of the daily life. Cultural spots such as the old town or royal castle are experienced as touristy. Rating but also the frequency of the places correlate with the appearance on the tourist maps: all the top 16 places are mentioned on the tourist map or USE-IT map, except the general expression 'shopping street'. Of the total of 55 places, 34 were marked on the official tourist map, 20 on the USE-IT map.

1. Classification

48% of all mentioned places were classified as landmarks, 37% as nodes and 10% as paths. The high share of nodes is explained by the categorization of the old town of Warsaw as a node. Paths are mainly seen with the commercial street 'nowy swiat', but no other streets. The river Wisła designates edges, while 3% of the mentions are dedicated to districts. Therefore, the graph suggests a landmark-dominated picture of the city with a minor importance of nodes, and less weight on the other city elements.

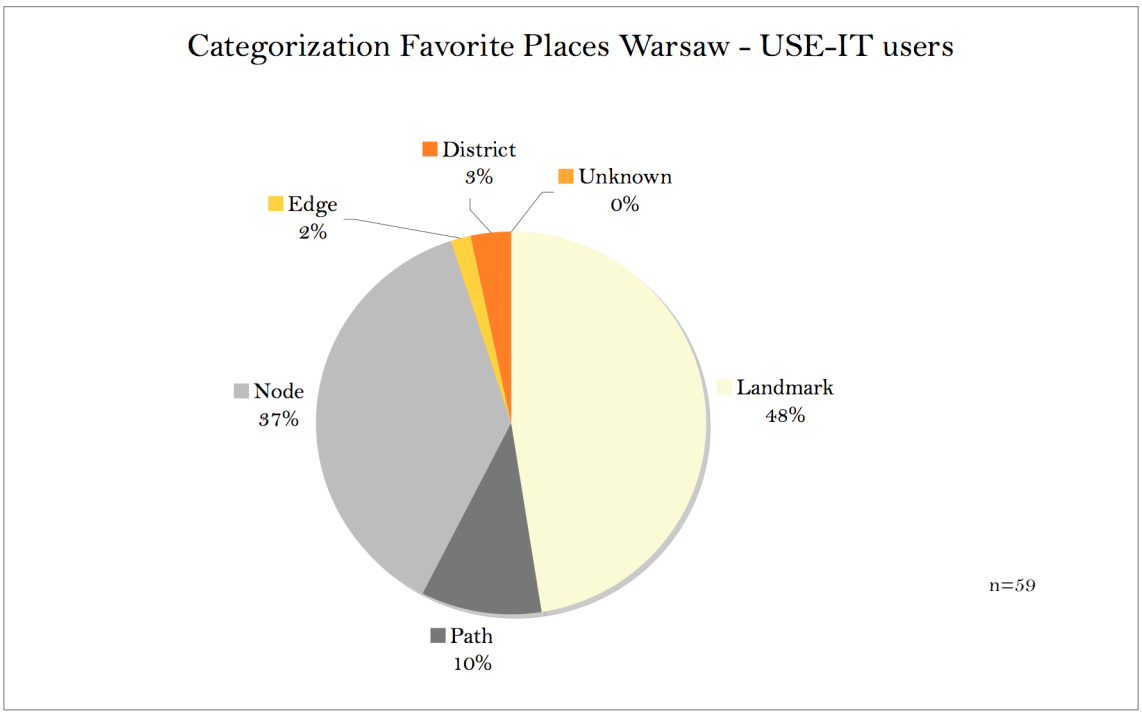


Figure 5:11 Cateogrization Favorite Places Warsaw - USE-IT (source: own survey)

With the high frequency of the 'old town' and the 'Palace of Culture&Science', a greater distribution between the different categories did not occur. This concentrates and narrows down the city picture to a few elements, mainly landmarks and nodes.

Duration of Stay

As in Brussels, a correlation between the duration of stay and the naming of places was analyzed. In this small sample, nodes (including the highlight of the old town) represent 37% of the mentions by a stay of 1 night. Hence, the longer tourists stay in Warsaw, the less frequent the 'old town' and therefore nodes become.

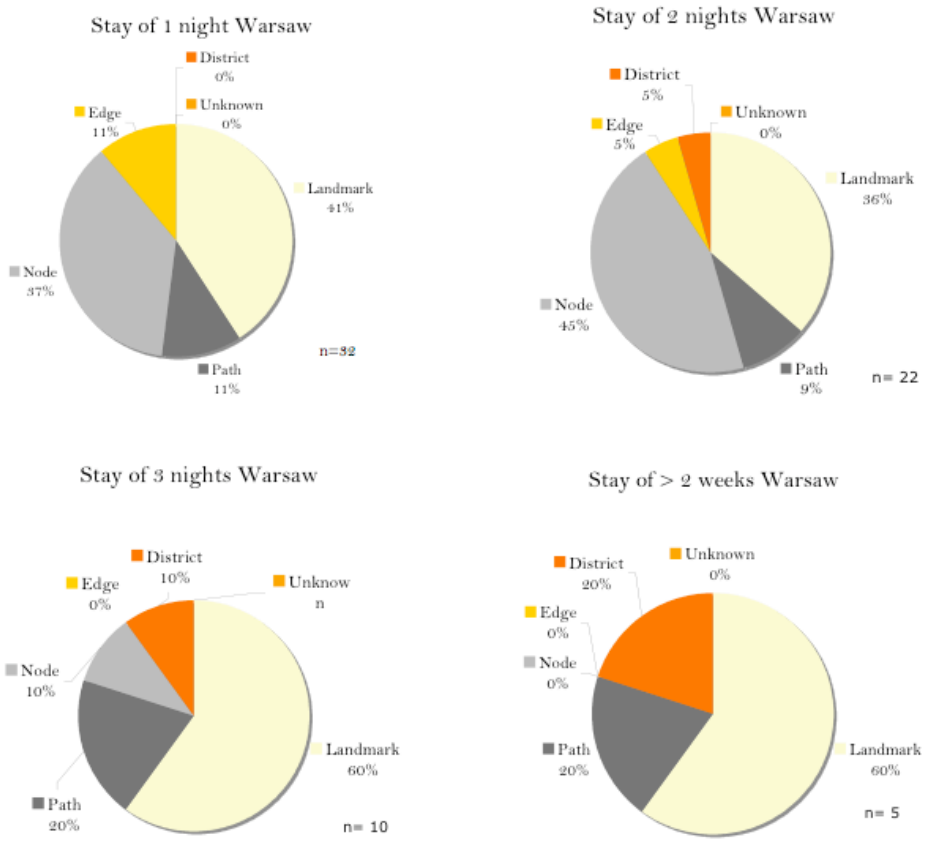


Figure 5:12 Duration of Stay - Warsaw (source: own survey)

With a stay of 3 nights, districts, paths and landmarks gain importance. The city image shifts from a node-dominated towards a landmark-dominated structure. Therefore, the main tourist attraction 'old town' may not be mentioned anymore, but do landmarks still prevail the perception of the city space.

As only one respondent of the USE-IT map users was visiting Warsaw more often, while all other subjects were experiencing the city for the first time, no further interpretation or discussion will be made. Similar to Brussels, those figures do modify the results, as an unequal sample distribution was presented.

Mental Maps Warsaw

To gain a comparable grounding between the case studies, the mental maps of Warsaw are categorized in the same way. Hereby, the identifying features of the city elements resemble the same as on the Brussels mental maps in chapter 5.1.

The 13 mental maps consist of 96 different city elements and were classified according to the figure 5:11. Landmarks represent with 36% the most important category, and are connected by paths. Nodes (old town) and edges (river Wisła) present 20%, respective 14% of the mental maps and identified through their names. Districts play a minor role on the mental maps, but were indicated by name.

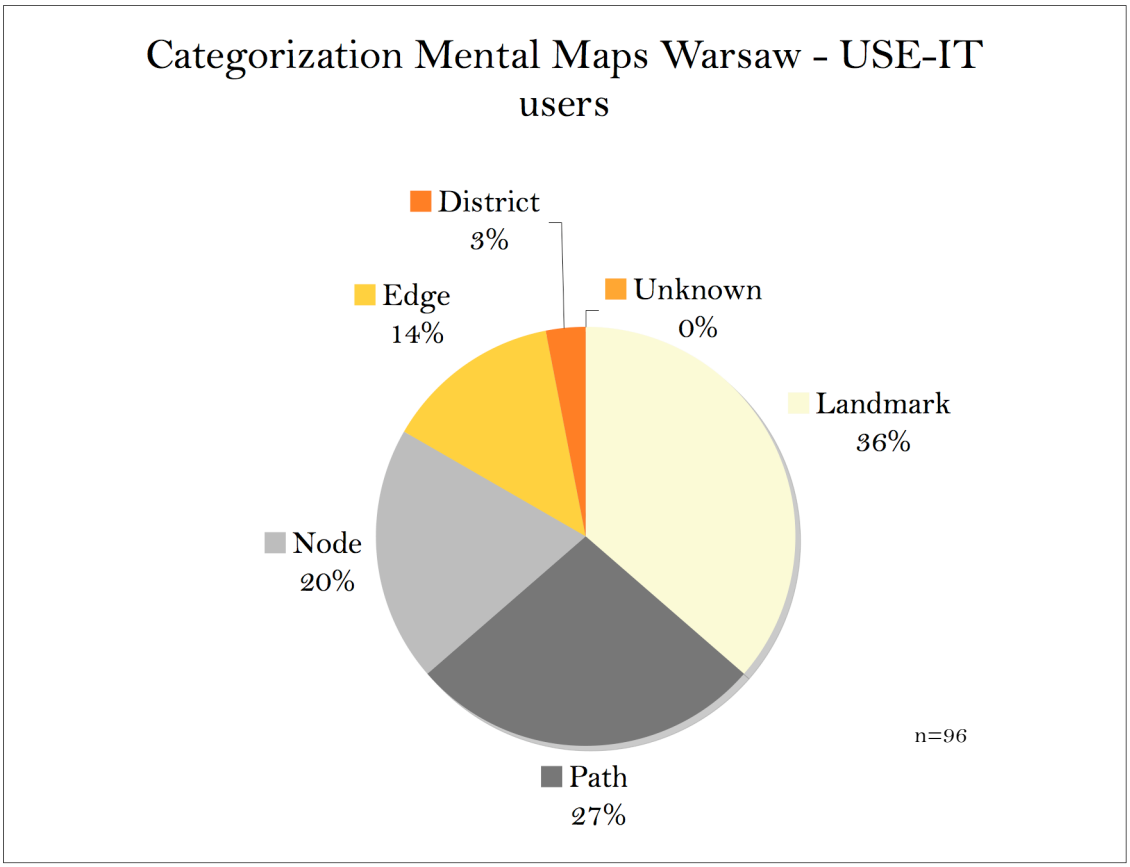


Figure 5:13 Categorization Mental Maps - Warsaw USE-IT (source: own survey)

Comparing the notion of the favorite places with this classification, a decrease of the numbers of nodes and landmarks is remarkable. Paths, as connecting element, increase as well as the notion of edges. This development can be explained by the distinction between favorite places and the drawing of a map. Often, the favorite places were marked on the

mental map and additional elements, such as the river or connecting paths, were attached. This creates a relation between locations and better overview of the city image. Also here, not all paths or landmarks are named. Often, a characteristic sign indicates a certain object but can only be recognized as such, if known. Further, representative images, such as an oval circle for the football stadium, can be found on few mental maps.

Duration of stay

When distinguish the length of stay, the importance of certain city elements according to the city perception becomes visible.

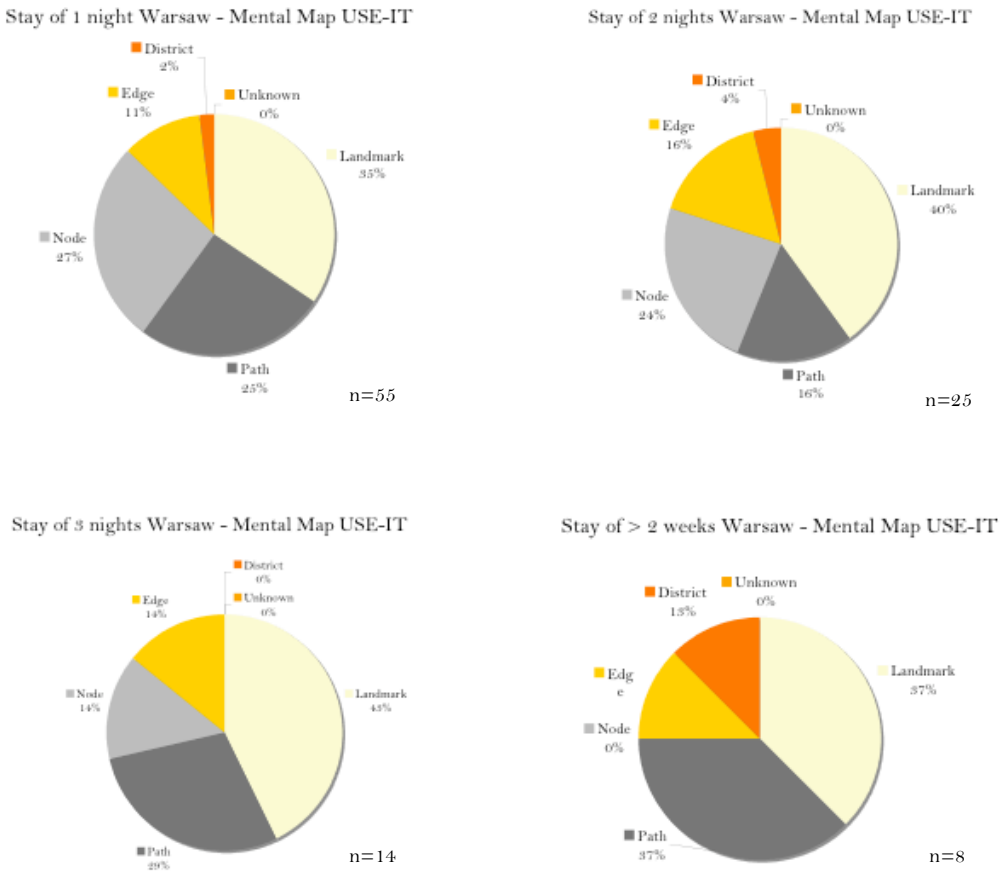


Figure 5:14 Duration of Stay Mental Maps Warsaw - USE-IT (source: own survey)

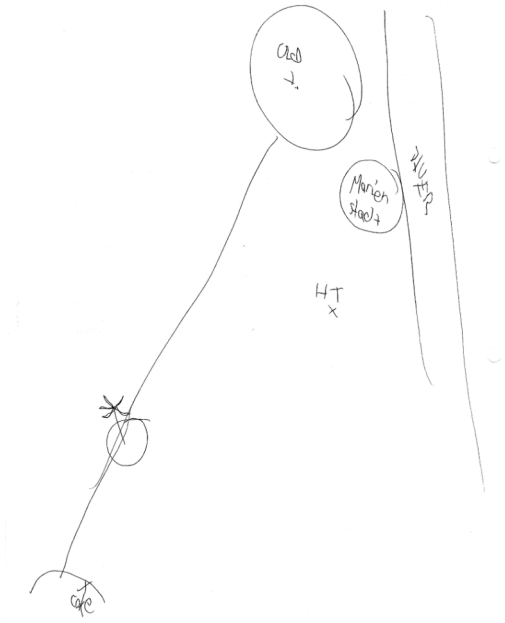
Paths and districts appear more often, the longer a tourist stayed in the city. The notion of nodes declines, whereas landmarks and edges appear with the same importance. This development seems remarkable, as therefore the old town looses attention, while overall impressions and a more holistic city image prevail.

To have a detailed look into one representative mental map with the distinction between the duration of stay, the following pictures show 4 different mental maps:

Picture 5:5 presents landmarks, but also nodes and edges with no drawn relation to each other, while the shape and orientation of the nodes and edges are perceived realistically. No symbols, but names indicate the different locations. Hereby, a fragmented city image with no relation through paths is perceived.

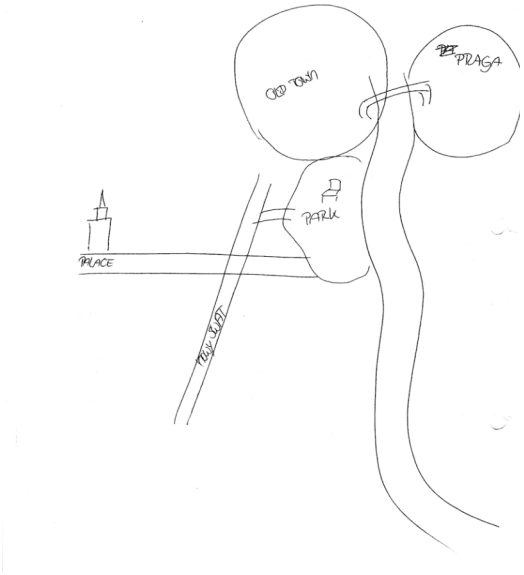
Picture 5:5 Mental Map - one night Warsaw (source: own survey)

With an increase on the duration of stay, an increase of orientation is readable in picture 5:6. Now, most of the locations are connected through paths, and the city elements named or signed. Here again, no landmarks are characterized by symbols, also the naming of places is simple. The old town is indicated through a circle, but no extra landmarks or identifying objects are marked. The city image is still fragmented and lacks of details although more related through paths.



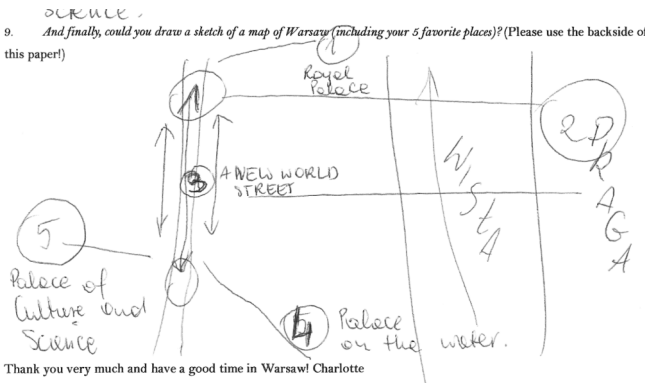
Picture 5:6 Mental Map - two nights Warsaw (source: own survey)

The third picture 5:7 contains a relation between the locations and connects the different city elements. Paths are drawn as navigation tool and allow a coherent city perception. Circular lines and names separate districts or nodes, but no detailed structure or identifying landmarks can be found within. Only small drawing indicate single landmarks and present few subjective impressions on the city. The other elements are drawn clear and simple and can therefore be easy adopted and remembered.



Picture 5:7 Mental Map - three nights Warsaw (source: own survey)

Finally, picture 5:8 contains connections between all mapped objects as well as names. Through paths and arrows, locations are set into relation to each other, but do not conform realistic geographical orientation. Distances are simplified, as well as the city elements. Hereby, no detailed symbols or representative images, but numbers referring to the favorite places characterize this mental picture. Hence, the city space is perceived as connected structure with landmarks as reference points.



Picture 5:8 Mental Map - > 2 weeks Warsaw (source: own survey)

The overall picture presents a narrow view on the city and only with increase of duration, districts or objects East of the river Wisła are mentioned. Also, the perception of Warsaw shifts from a fragmented landmark oriented space towards a structured image, which is connected by paths. The locations of places, as well as the imagined distances were distorted in all mental maps, but decreased with a longer duration of stay.

Representation of space Warsaw

In line with the analysis of the Brussels sample, landmarks dominate the overall city image of young travelers in Warsaw. Of the 55 mentioned favorite places, 48% were classified as landmarks and 37% as nodes. The high share of nodes is explained by the categorization of the 'old town', the place with the highest frequency in this study, as a node. The dispersion of the mentioned places stretches through the whole city and is not only concentrated around the old town. Also, with a detailed study of the mentions according the different duration of stay, the 'old town' becomes less important. Therefore districts and paths increase their appearance. Regarding the favorite places, the perception of space shifts from a node-dominated towards a landmark-dominated structure.
Analyzing the 13 mental maps of the USE-IT users, 96 different city elements were cited. Here, an increase of paths comparing to the favorite places is remarkable, which function as connecting elements. Often, the drawn objects are not symbolized or named, while only some refer to numbers of favorite places. More clear and simply structures represent the city elements. The city perception is fragmented and narrowed down to the close surroundings of the old town. With a greater duration of stay, this limited space increases and combines more city elements in its spatial knowledge. Now, with a stay of more than 4 days, the mental images are structured and connected through paths.

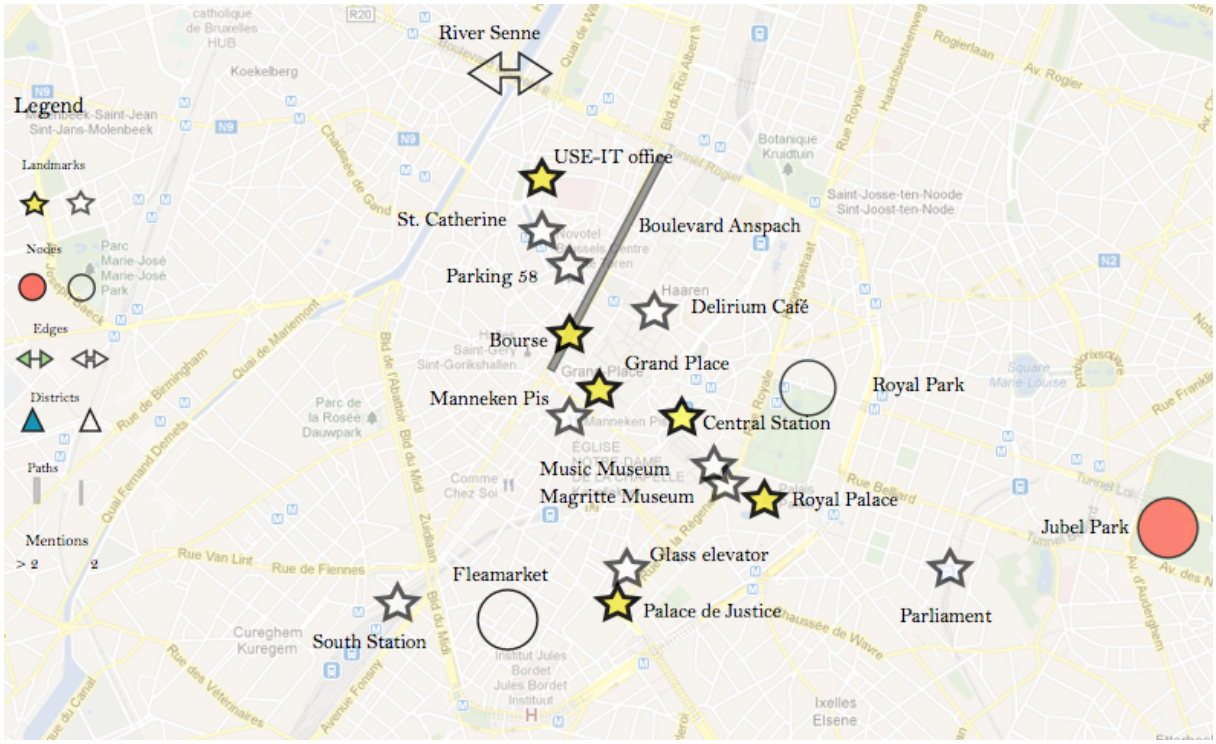
Therefore, the representation of Warsaw in those favorite places or mental maps concentrates on the notion of the old town and landmarks, and does not correlate with the location of residency. Distortions were found in all mental maps, regarding distances or placement of objects.

5.3. Comparison between the cities & maps

In both cities, the perception of space was analyzed and the city image interpreted. Thereby, the categories of Lynch (1960) supported the research and allowed a classification of the mentioned places and drawn objects.

Brussels USE-IT vs. other tourist map

Landmarks dominate the mental maps of the Brussels USE-IT users. The reflection of those elements is strongly presented in all cognitive images and creates a fragmented city system of single objects without any connecting elements. Striking hereby is the 'imageability'[6] of those landmarks. While the Grand Places according to Lynch (1960) should be seen as a node, all tourists refer to it as a landmark. The tower of the town hall or other significant symbols are summarized and perceived as a whole, as a singular object. The reference points of the tourists do not necessarily have to be unique, outstanding architectures, but recognizable structures. The totality and not the singularity are in focus. Paths, edges and nodes play minor roles on the mental images and occur as connecting elements.



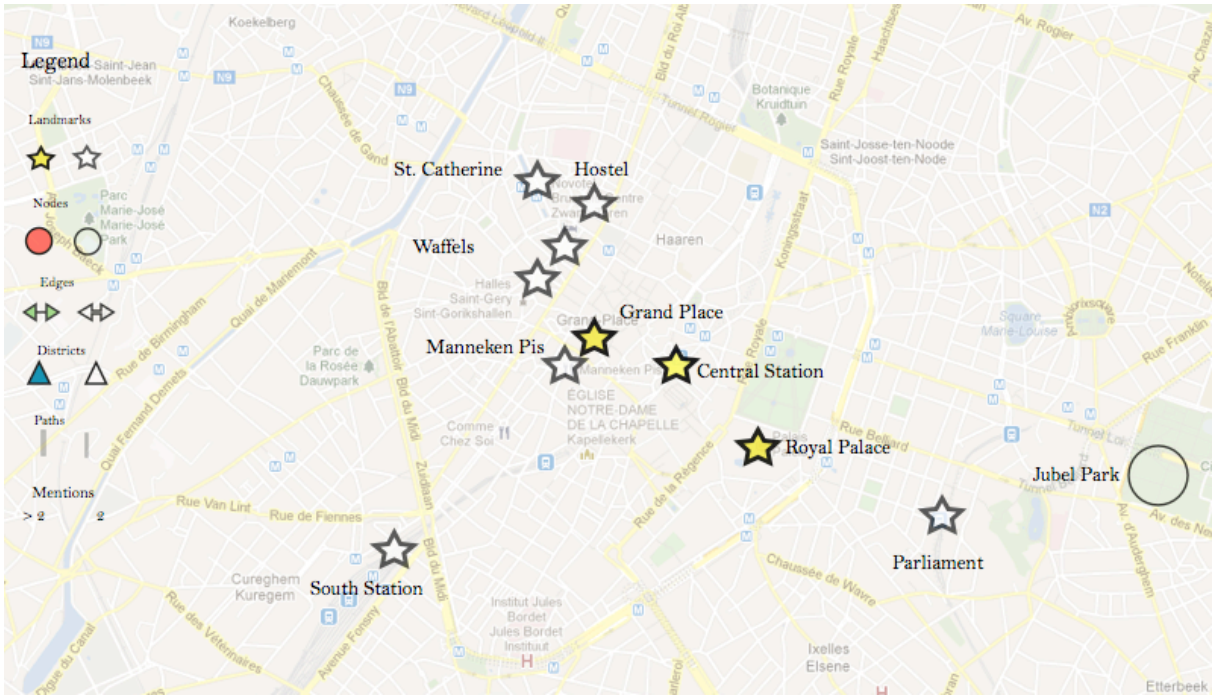
Picture 5:9 Summary Mental Maps USE-IT map - Brussels (source: own survey; maps.google.com)

[6] Definition according to Lynch (1960): "quality in a physical object which gives it a high probability of evoking a strong image in any given observer." (9)

The picture 5:9 and all other pictures following, show a collage of all drawn mental maps in one category. Hereby, major elements, which were mentioned more than two times, were colored, while elements with two mentions were signed with the particular symbol. Places with less than two mentions were not marked.

Those pictures then allow a better overview of the created city images for the further discussion.

Non-USE-IT map users perceived the city space in a similar way, and name and sketch mainly Grand Place or other landmarks. Also the scope of the city is in all mental maps limited to the historical center, Brussels Ville, often indicated through a circle around all landmarks. Yet, the river 'Senne' was only mentioned in four cases. The frequency of general expressions or unknown places was higher with tourists using other city maps than USE-IT map users.



Picture 5:10 Summary Mental Maps other tourist map - Brussels (source: own survey; maps.google.com)

Therefore, the mental maps of the USE-IT map users and those, using other devices do not differ in the perception of city space. Both read the city as a landmark dominated structure with loose territorial coherence and less connecting elements. Paths, districts or nodes are mentioned little and do not account for the creation of the city image of Brussels.

Warsaw USE-IT vs. other tourist map

Both sample groups, USE-IT users and subjects using other maps, present an image of Warsaw dominated by landmarks and nodes (see pictures 5:10 and 5:11). The river Wisła occurs on almost all mental maps and plays an important reference point. Landmarks orientate along this river, instead of being connected by streets. Although the old town displays another major element, it has no significant or singular representative aspect or building.

Picture 5:11 Summary Mental Maps USE-IT map - Warsaw (source: own survey; maps.google.com)

The 'nowy swiat', one major consumption street, was named in seven mental maps and is marked as a path. Yet, this path does not function as an orientation tool, but as the goal. Tourists visit it, not for passing through, but experiencing it. So, even this path is seen in its symbolic value and not its function.

Still, the perception of the city by USE-IT users is more multifaceted regarding the classification of Lynch (1960), than of those using other maps. While the latter group remembered more landmarks and sights close to their hostel and around the old town, USE-IT map users were gaining a more holistic and spread out picture throughout the city. So, more nodes and edges were cited and created a diversified image of space.

Picture 5:12 Summary Mental Maps other tourist map - Warsaw (source: own survey; maps.google.com)

Similar to mental maps of the USE-IT map users was the urban experience of users of other tourist maps strong related to landmarks. Even on the mental maps, few connections between different locations were drawn and result in a fragmented image. The river Wisła and the old town were here as well the most frequent mentions.

Two case studies: USE-IT map users

The comparison of those two cities and their perceptions is not analyzed by means of their historical development or city structures, but on behalf of symbolic values of the mental maps.

In both case studies, the representation of space through a USE-IT map was studied. Both USE-IT maps offer local tips and suggest experiences of the everyday life. Still, the perception of the cities occurs in a domination of landmarks, the tourist's imaginary is related to strong representative symbols.

All mental maps of Brussels indicate the Grand Place as the main reference point, which is drawn as a center. Similar to the Eiffel Tower in Roland Barthes work "The Eiffel Tower" (1997a), this square represents the picture of the city and creates its symbolic values. Hereby, not one singular object, but the unity of the square forms this representation. To that symbolic landmark, other objects are connected and are set into relation with this center. Paths only play a minor symbolic role in this imaginary, as well as districts and edges. Nodes are mentioned and remembered in few cases.

The representation of space in Brussels is therefore dominated by characteristic and symbolic objects, which present the value of the city. Most of those landmarks are connected by paths and allow thereby still a holistic city image.

While Brussels offers still a connected and structured image of the city, the perception of Warsaw is more fragmented. Here, a greater variety of the named city elements are present, the river Wisła is one of the major mentions. Often, this edge is used as reference point for the location of other landmarks, which are not connected with each other. Interesting hereby is also the lack of representative architecture. While the old town is referred as 'circle with name' and not as singular object, few other symbols of landmarks are drawn. This result can be caused by the historical development and rebuilding of the city after the WWII, but leads towards a small legibility of space.

Additional to the holistic representation of Brussels, the city space is connected within its USE-IT map network. 30% of the responding USE-IT map users in Brussels consider a visit in another USE-IT map city. Could this influence the representation and perception of city space, when the city and its map are known before? The proximity of cities with USE-IT maps plays hereby an important factor, as for Warsaw, which has no nearby USE-IT map cities, only one respondent affirmed the visit of other USE-IT map cities.

Regarding the duration of stay, in both case studies correlations to the perception of space was found. In Brussels, an increase of the duration of stay created a more holistic city image and increased the notion of paths and legibility of the city. Also in Warsaw, with the increase of the length of the visit, the area limitation was extended and important nodes, such as the old town, less frequent. Therefore, small evidence of the theory of Lynch (1960) could be found. According to Lynch theory, the importance of paths increases with the greater familiarity of the city (Pearce 1977). Still, a correlation between the frequency of the city visits and the familiarity of the city could not be found in both case studies.

6. Conclusion

Research Question: How is the spatial experience of a city map reflected in the perceived images of this space?

The mental maps of the case studies in Brussels and Warsaw presented a strong landmark-oriented image of the cities. Through classifying the drawn objects on the mental maps into the five categories mentioned by Lynch (1960), this analysis was possible. Most of the young traveler perceived a city image shaped by tourist sights and symbolic values. Despite the local and diverse suggestions on the USE-IT maps, those places were significantly limited on the drawn mental maps. Therefore, city landmarks, on the USE-IT map marked as 'tourist classic', play such an important role in the reading of the city, that the local urban experience is undermined. The symbolic representation of the city space on those mental maps leads to the conclusion that tourists - even young travelers - do understand the city by means of their strongest landmarks. As Barthes (1997b) says, "signification possesses irreducible specificity"(168), those strong images in form of landmarks, attract the tourists immensely and dominates the city image. The absence of the Atomium, one major landmark in Brussels indicates the area restrictions or great distance to the city center. Tourists want to represent their perceived image with the same symbols the city is offering and do not include their local experience, such as social impressions, local insights or cultural facts.
The readability of space plays an important factor to this, as in Warsaw, many landmarks or other places were not perceived in their physical or symbolic value, but by presence or name. Often, only 'the old town' or 'castle' was signed on the mental maps instead of a symbolic figure. Hereby, historical developments may have influenced the legibility of the urban space and experience.

The perception of space by USE-IT map users is influenced by the local experience and creates a multifaceted image of the city.

The hypothesis was falsified by the empirical outcome of this thesis. The mental maps of the USE-IT map users do not differ significantly from those of other tourist map users and suppose no indications of local experiences. Local experiences could have appeared in form of a less landmark-dominated, but more district or node oriented urban image and relate urban structures to cultural or social understanding. With only some mentions of the USE-

IT office in Brussels, or on the USE-IT map indicated cafes or events, no multifaceted and local image of the cities was created. The everyday life of the particular cities might have been perceived through those cities, but do the representation of the city images on the mental map not express those. Therefore, the bodily experience, the everyday life or ordinary space George Perec was mentioning, was not captured on paper nor remembered. Physical elements, important landmarks and famous sights still dominate the city picture and the urban space and correspond the definition of space by Krier (2005).

"At the same time, some forms of institutional commemoration or official memories within societies silence alternative memories of the places and the past and involve particular senses, especially sight. Certain landscapes or distinctive buildings and monuments are often taken to represent a nation in ways that undermine alternative memories of other social groups, especially those of women and subordinate ethic groups" (Urry 1999: 85).

As Urry states, tourists arrive in a new place with "official memories", which are perceived before even the sight was visited (1999). This allows the visitor to create a city image first and adjust or add new places afterwards. Those strong landmarks influence the urban experience and its perception and may not be modified by specific city maps.

Outlook

Those empirical results are based on a small sample, and were analyzed through qualitative methods. For a further research on the perception of mapped space, a wider scope and sample size could result in different outcomes. Also, the field of electronic or mobile forms of guides and maps was not studied in this thesis and might influence the traveling behavior and modify the perception of the city.
As seen in this research, a categorization of the five city elements, according to the theory of Kevin Lynch (1960), was in some cases equivocal, as many tourist highlights were seen as one landmark, but technically nodes or paths. This leads to a different reading of the representation and perception of space and opens new research topics regarding the symbolic value of tourist sights.

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Dresden (2012): http://www.use-it.travel/cities/detail/dresden/
Turin (2012): http://www.use-it.travel/cities/detail/turin/
Vienna (2012): http://www.use-it.travel/cities/detail/vienna/
Warsaw (2012): http://warsaw.use-it.travel/

Other maps

CitySpy: http://www.cityspy.info/

8. Annex

Annex A: List of favorite places in Brussels with one mention

Places Brussels	*Frequency*	*Frequency of USE-IT*
1000 Beer Bar	1	0
2GO4 Hostel	1	0
African Museum	1	1
Art deco architecture in general	1	1
Atomium	1	1
Avenue des Arts Area	1	1
Beer Codes	1	1
Beguinage = Place du Beguinage	1	1
beursschouwburg	1	1
Botanique	1	1
Bozar	1	1
Celtic Bar (=Celtica)	1	1
Chips Store	1	1
Chocolat	1	0
Chocolate Stores near Mannekin Pis	1	0
Cimentiere d'Ixelles	1	0
Comic Museum	1	1
Dominican Hotel Patio	1	1
Fin du Siecle Restaurant	1	1
Flea Market	1	1
Fleamarket Marollen	1	1
Forest	1	1
Fountain at St. Catherine Church	1	1
Grasmart Street	1	1
Groceries	1	1
Halles Saint-Grey	1	1
La Bourse	1	1
Lava (Cafe)	1	1
Louise	1	1
Military Museum	1	1
Most Cafe/Restaurants	1	1
Musees Royaux, Bozar	1	1
Notre Dam	1	1
Other Cathedral	1	0
Park	1	1
Parking 58	1	1
Parliament EU	1	0
Quartier des Halles St. Gery	1	1
Rue des Bouchers	1	0
Sablon Petit (square)	1	1
Shopping area	1	1
St-Gilles	1	0
The graffiti on the walls	1	1
Train Station		0
Warandepark	1	1
Waterloo battle field	1	1

(source: own survey)

Annex B: List of favorite places in Warsaw with one mention

Place Warsaw	*Frequency*	*Frequency of USE-IT*
Bar Corso	1	0
Bazaar	1	1
Castle	1	1
Centrum Shopping Mall	1	0
Dom Literatury (Hotel)	1	0
Food	1	0
Gardens	1	0
Kiuy Palace	1	0
Marienstadt	1	1
Museum Narodowe	1	0
Museum Wojska Polskiego	1	0
Nice people I met in this hostel	1	0
Old Town Cafe	1	1
Old Town Square	1	0
Palace on the Water	1	1
Park Lazienki	1	0
Plac Lamleowy	1	0
Plac Piłsudskiego	1	0
Plac Zbawiciela	1	0
Pubcrawl	1	0
River Park	1	1
Royal Palace	1	1
Shops/Market/Food	1	0
Tamka Hostel	1	1
The bank of Wisla	1	0
The old jewish Ghetto	1	0
Warszawa Zoo	1	0
Wisla Park	1	0
Yesterday's Bar	1	0

(source: own survey)

Annex C: Overview Categories Lynch USE-IT map Brussels

	Landmarks	Paths	Nodes	Edges	Districts
Numbers	1, 3, 4, 5, 8, 9, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 25, 26, 27, 30, 34, 32, 33, 34, 36, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 53, 54, 55 A, B, C, E, G, K, M, N, P	2, 7, 28, 35 North Walk, European Walk, South Walk, D	6, 29, 34, 45, 51, 52 B, F, J, K, L, O, R	34	4, 10, 11, 16, 23, 29, 34, 37, 43, 50, 56 E, H, I, M, N, O, Q
Percentage	55%	9%	15%	1%	20%

(source: USE-IT map Brussels 2012)

Annex D: CD with recorded interviews

Curriculum Vitae

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Project-Management Kurs	Universität Zürich, 2008
MUN Team UZH	Mitglied des „Model United Nations" - Vereins der Universität Zürich (z.B. HamMUN 2008, Hamburg, Deutschland) 2008 – 2009
BLS	Soziale Arbeit an "Bayrische Landesschule für Körperbehinderte" 2003

Berufserfahrung

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2008 - 2009	Tutor der Übungen „Fernerkundung I" an der Universität Zürich September – Februar 2008/2009

Sprachkenntnisse

Deutsch:	Muttersprache
Englisch:	fliessend (TOEFL-Test)
Latein	großes Latinum
Dänisch:	Anfängerkurs
Französisch:	Anfängerkurs

Computerkenntnisse

OS:	Windows (98, 2000, XP), Mac OS X, Linux
Programme:	MS Office (Word, Excel, PowerPoint), Open Office, iWork, SPSS, ArcGIS (ESRI), ERDAS IMAGINE
Programmsprachen:	HTML (Basic Lessons), MatLab

Hiermit versichere ich, dass die ich die vorliegende Masterarbeit selbstständig verfasst, andere als die angegebenen Quellen und Hilfsmittel nicht benutzt und mich auch sonst keiner unerlaubter Hilfe bedient habe, dass ich dieses Masterarbeitsthema bisher weder im In- noch im Ausland in irgendeiner Form als Prüfungsarbeit vorgelegt habe und dass diese Arbeit mit der vom Begutachter beurteilten Arbeit vollständig übereinstimmt.

I hereby assure to have produced this Master thesis without help of others and only with the quoted sources. All information from external sources is marked as such. This thesis has not been presented in this or a similar form to an examining authority before.

Vienna, date Signature